

INCENTIVE REIMBURSEMENT:
EVALUATION OF AN EXPERIMENT

PART ONE



HOSPITAL RESEARCH AND EDUCATIONAL TRUST

REPORTS
RA
971
.3
H65
1974
pt.1

RA
971.3
-H65
1974
pt.1

Incentive Reimbursement:
Evaluation of an Experiment

Part 1

Summary

James P. Cooney Jr., Ph.D., Principal Investigator
Martin B. Ross, Project Director

Supported by
Social Security Administration
Department of Health, Education, and Welfare
Contract SSA 70-3037

Computing Assistance Obtained from
Health Science Computing Facility
University of California, Los Angeles
Sponsored by National Institute of Health
Research and Resource Grant RR-3

Hospital Research and Educational Trust
840 North Lake Shore Drive
Chicago 60611

CONTENTS

List of Tables	v
Foreword	vii
Project Staff and Advisory Committee	ix
Introduction	1
Origin of the Incentive Reimbursement Experiment	
Development of the Experiment	
Evaluation of the Experiment	
Methodology	3
Experimental Design	
Evaluation Design	
Major Conclusions and Recommendations	9
Conclusions	
Recommendations	
Summaries of Evaluation Components	15
Technical Projects	
Case Studies	
Quantitative Analysis of Experimental Results	
Definitive Conclusions and Recommendations	71
The LPC Program	
Experimental Techniques and Procedures	
Overall Results	
Commentary	79
Organizational Change	
Institutional Financial Incentives	
Organizational Readiness and Capacity to Change	
Summary	
Appendix A. Case Study Interview Schedule	85
Appendix B. Overview of <i>Incentives of Hospital Cost Containment: Theory, Practice and Prospects</i>	95
Appendix C. Selected Characteristics of Experimental Hospitals	97
Glossary	99

LIST OF TABLES

Table 1	Summary of Financial and Performance Results for Incentive Years and Cumulative and Overall Results by Hospital	50
Table 2	Average Adjusted Performance Index by Bed Size, Ownership, Change in Performance Index (PI), and Previous CASH Affiliation for Experimental Years	51
Table 3	Average Gross Savings (Losses) by Bed Size, Ownership, Change in Performance Index (PI), and Award Status for Incentive Years	53
Table 4	Net Incentive Awards (Hospital Total and Average per Hospital) for Hospitals Earning an Award, in Incentive Years	53
Table 5	Average Change in Adjusted Performance Index by Bed Size, Ownership, Change in Performance Index (PI), Award Status, and Previous CASH Affiliation for Incentive Years	54
Table 6	Average Occupancy Rate by Bed Size, Ownership, and Change in Performance Index (PI) for Experimental Years	56
Table 7	Maximum/Minimum Days per Hospital and per Bed Spent by CASH Representatives During Incentive Years	57
Table 8	Average Number of Days and Average Number of Days per Bed Spent by CASH Representatives for All Hospitals and for Subgroups, Determined by Change in Performance Index (PI), for Incentive Years	58
Table 9	Average Inpatient Payroll Cost per Patient Day by Bed Size, Ownership, and Change in Performance Index (PI) for Experimental Years	59
Table 10	Average Change in Inpatient Payroll Cost per Patient Day by Bed Size, Ownership, and Change in Performance Index (PI) for Incentive Years	60
Table 11	Average Change in Adjusted Inpatient Payroll Cost per Patient Day by Bed Size, Ownership, and Change in Performance Index (PI) for Incentive Years	61
Table 12	Summary of Comparison of Performance Change in Selected Major Departments for Second and Third Incentive Years	62
Table 13a	Linear Regression Model, Including All Hospitals, First Year, With Change in Performance Index (PI) as Dependent Variable	64
Table 13b	Linear Regression Model, Including All Hospitals, Second Year, With Change in Performance Index (PI) as Dependent Variable	65
Table 13c	Linear Regression Model, Including All Hospitals, Third Year, With Change in Performance Index (PI) as Dependent Variable	66
Table 14a	Linear Regression Model, Excluding County Hospitals, First Year, With Change in Performance Index (PI) as Dependent Variable	67
Table 14b	Linear Regression Model, Excluding County Hospitals, With Changes in Performance Index (PI) as Dependent Variable	68
Table 14c	Linear Regression Model, Excluding County Hospitals, Third Year, With Change in Performance Index (PI) as Dependent Variable	69

FOREWORD

In October 1969, the Social Security Administration (SSA) contracted with the Hospital Services of Southern California (Blue Cross) to conduct an experiment designed to test an alternative to the currently predominant cost (plus) method of reimbursement for hospital care. The alternative, tested by the Commission for Administrative Services in Hospitals (CASH) under subcontract with Blue Cross, was based on the offer of a financial reward as an incentive for hospital managements to reduce costs through the use of labor cost-control techniques. Twenty-five hospitals* in the Southern California area served as experimental test sites during the three-year Incentive Reimbursement Experiment (IRE).

In June 1970, SSA contracted with the University of California at Los Angeles for an independent evaluation of the Incentive Reimbursement Experiment. In 1971, the principal investigator of the evaluation project became the associate director of the Hospital Research and Educational Trust, Chicago, Ill., and the contract was transferred to the Trust.

The procedures, findings, and analyses of the evaluation project have been organized into the following reports:

- *Incentive Reimbursement: Evaluation of an Experiment*, an overview and summary of the total project;
- *Incentives for Hospital Cost Containment: Theory, Practices, and Prospects*, a "state of the art" review of incentive mechanisms in concept and operation;
- *Experimental Hospital Case Studies*, an indepth analysis of the environment and the impact of the experiment on that environment in seven of the test hospitals; and
- *Working Papers*, a compendium of technical working papers, developed throughout the course of the project, in the following areas: the experiment's sampling design technique and results; the selection and analysis of control group hospitals; the evaluation data system; the process used in auditing experimental data; CASH systems and procedures; the incentive reimbursement formula; a comparative performance analysis among experimental hospitals, and a comparative performance analysis between experimental and non-experimental hospitals.

Copies of all project reports are available from the Hospital Research and Educational Trust, 840 North Lake Shore Drive, Chicago, Ill. 60611.

The evaluation project staff was assisted in its effort by many groups and individuals. While it is impossible to list all of them, the staff would like to acknowledge the support and guidance of the following: The Commission for Administrative Services in Hospitals, particularly Robert H. Edgecumbe, president, Harold E. Buck, vice-president, and the CASH field staff; Hospital

*Originally 26 hospitals were selected for the experiment. However, one institution did not participate for the full study period.

Services of Southern California; the Hospital Council of Southern California; the staffs of the experimental hospitals, especially those of the seven institutions used as case study sites; the project advisory committee, and Leon Bernstein, Dr. P.H., senior social science research analyst, Division of Health Insurance Studies, Social Security Administration.

1974

PROJECT STAFF

PRINCIPAL INVESTIGATOR

James P. Cooney Jr., Ph.D.

PROJECT DIRECTORS

Martin B. Ross (May 1971 — May 1974)

L. Briane Browne (June 1970 — May 1971)

RESEARCH ASSOCIATES

Shu-Pi Chen, Dr. P.H.

Mary-Lynn Doscher

Jeffrey Kirschner

Frank Loge

Diane E. Rowland

SECRETARIES

Debbie L. Boyd

Barbara Carnegie

Lanng M. Tamura

EDITORS

Dolores E. Henning

Elizabeth G. McNulty

ADVISORY COMMITTEE

Burnham O. Campbell, Ph.D.

Professor and Chairman

Department of Economics

University of Hawaii

Russell C. Koza, Ph.D.

Assistant Professor

Division of Health Administration

Medical Center

University of Colorado

E. Gartley Jaco, Ph.D.

Professor and Chairman

Department of Sociology

University of California at Riverside

Ephraim McLean, Ph.D.

Assistant Professor

Graduate Business Administration

University of California at Los Angeles

INTRODUCTION

Today, hospital operating costs are among the vital concerns of people receiving and providing health care in this country — patients and leaders in the hospital field, in the health insurance industry, and in state and federal governments. This widespread concern has resulted from sharp increases in the cost of medical and hospital care, beginning in the early sixties and accelerating toward the end of that decade.

In recent years, a number of attempts have been made, by both the private and the public sectors, to slow the acceleration of these costs. (As a major purchaser of health care services, principally through the Medicare program, the federal government is particularly interested in the problem of hospital costs.) Among attempts to contain costs have been government-imposed wage and price controls and various programs for limiting capital expenditures, reviewing budgets on a prospective basis, and developing state hospital commissions charged with reviewing hospital operating costs. The Incentive Reimbursement Experiment (IRE) evaluated in this report represents yet another alternative to assist in solving the problem(s) of hospital costs.

ORIGIN OF THE INCENTIVE REIMBURSEMENT EXPERIMENT

Two separate and distinct developments occurred in the sixties that laid the foundation for this experiment. The two were the founding of the Commission for Administrative Services in Hospitals (CASH) and the passing of Medicare and Medicaid legislation.

The Commission for Administrative Services in Hospitals

The Commission for Administrative Services in Hospitals, sponsored by the Hospital Services of Southern California (HSSC/Blue Cross) and the W. K. Kellogg Foundation, was incorporated as a nonprofit organization in 1963. One of its purposes was to determine whether industrial engineering techniques — used successfully in industry — could be applied to hospitals to reduce or contain accelerating costs and, if so, whether they could be applied without sacrificing quality of care.

Staffed by management engineers who specialized in hospital management and control systems,

CASH began its efforts to develop programs, on a department-by-department basis, to help administrators and department heads contain costs and improve the quality of hospital services. These programs were based on previously developed work standards, data from other studies, and time studies conducted by CASH consultants. The programs were designed to determine staffing requirements, to provide an objective means for the equitable distribution of work, to provide for the evaluation of work methods, and to provide an ongoing performance index for the control of personnel utilization.

By 1969, CASH had established standards data and units of measure for all hospital departments (or labor cost centers), which were incorporated into an overall program known as the Labor Performance Control (LPC) program. The LPC program is currently being used by most of the 250 California hospitals that subscribe to CASH. Participating hospitals are encouraged to use the departmental programs developed, together with services provided by CASH representatives, to improve the cost effectiveness of hospital operations, primarily through increased labor productivity.

Medicare and Medicaid Legislation

The second development that helped set in motion the reimbursement experiment was legislation committing the federal government to the financing of health care for a significant segment of the population. This commitment was made through the enactment of Title 18 (Medicare) and Title 19 (Medicaid — Medi-Cal in California) of the 1965 amendments to the Social Security Act.¹ Although methods of reimbursing hospitals had been a focal point of the negotiations and discussions that led to the 1965 legislation, it was not until 1967 that the idea of incentive reimbursement was formalized. It was formalized in a February report to the President on medical care prices by the Secretary of Health, Education, and Welfare, which recommended that the “reimbursement formulas used in Medicare and Medicaid be reviewed in an effort to find practical ways of increasing the incentives for

¹ The magnitude of this commitment is evidenced by the fact that from July 1 to December 31, 1966, the federal government reimbursed hospitals for \$800 million in services and from January 1 through December 31, 1967, it reimbursed them for almost \$3 billion.

hospitals and other health facilities to operate efficiently.”²

DEVELOPMENT OF THE EXPERIMENT

While hospitals participating in CASH programs were reported to have saved thousands of dollars in operating costs, it became apparent that the cost reimbursement and cost (plus) reimbursement formulas used by third-party payers generally represented a countervailing force to the encouragement of cost effectiveness. Under third-party reimbursement plans, which accounted for a significant portion of a hospital's revenue, the inefficient hospital could receive as much, if not more, revenue for rendering comparable services as the more efficient and cost-effective hospital.

This inequity in reimbursement plans precipitated discussions among representatives of the Hospital Services of Southern California, the Hospital Council of Southern California (HCSC), and the hospital administrators in Southern California. Subsequently, a 1967 feasibility study, conducted by CASH, indicated that it would be possible to measure labor performance and changes in labor performance in hospitals and to calculate cost savings and incentive payments for hospitals whose performance had improved.

As a result of these findings, HCSC and HSSC cooperated in the development of an incentive reimbursement plan based on CASH's LPC program. The two organizations provided a total of \$100,000, which was matched by the W. K. Kellogg Foundation, for a one-year incentive reimbursement experiment. Inasmuch as the proposed plan would cover only those payments made by HSSC — covering approximately 13 per cent of total

patient days for the average Southern California hospital — the sponsors of the experiment realized that the incentive offered might not be sufficient to obtain the desired results. They sought, therefore, to involve representatives of the Medicare and Medi-Cal programs.

The plan was presented to representatives of the Social Security Administration (SSA) with the request that patient days for Medicare recipients be included in the experiment to provide a stronger stimulus for cost control. Acting in conformance with the 1967 amendments to the Social Security Act, SSA approved the plan. Moreover, it provided an additional \$310,000 to extend the experiment over a three-year period. Subsequently, the state of California agreed to the inclusion of Medi-Cal patient days, bringing days covered to more than 50 per cent of total inpatient days for the average hospital.

The experiment took place during three consecutive years, beginning in 1970 and ending in 1972. Although calendar years were not used for all hospitals, the first incentive year generally approximated the 12-month period beginning in January 1970. The base-year, which was established for the purpose of calculating the initial incentive payment (loss), was the 12-month period that immediately preceded the first incentive year.

EVALUATION OF THE EXPERIMENT

The Social Security amendments that provided for the conduct of the Incentive Reimbursement Experiment also required that such experiments be independently evaluated. As a result, SSA contracted, in 1970, with the School of Public Health of the University of California at Los Angeles for the conduct of an independent evaluation of the experiment. As noted in the foreword to this document, the evaluation contract was subsequently transferred to the Hospital Research and Educational Trust.

² U.S. Department of Health, Education, and Welfare. *Reimbursement Incentives for Hospital and Medical Care, Objectives and Alternatives*. Research Report No. 26. Washington, D.C.: Government Printing Office, 1968, p. iii.

METHODOLOGY

In order to provide the necessary foundation for this evaluation report, the section that follows describes both the experimental research design¹ and the evaluation design.

EXPERIMENTAL DESIGN

Although the Social Security Administration's objective in funding the Incentive Reimbursement Experiment was not clearly delineated either in its original contract with the Hospital Services of Southern California or in the subcontract between HSSC and CASH, the objective was specified in the SSA guidelines. It was "to achieve greater efficiency and relatively lower cost without adversely affecting the quality of services provided."² More specifically, the Incentive Reimbursement Experiment was designed to encourage hospitals, by means of the offer of a financial incentive, to lower costs through improved labor productivity.

To meet this objective, it was necessary to select a representative group of Southern California hospitals to participate in the reimbursement experiment, institute a method (the LPC program) for measuring labor productivity in those hospitals, and develop a formula for calculating incentive gains (losses), based on changes in productivity.

Selecting the Hospitals

A stratified random sample technique was used by the Hospital Services of Southern California to select 26 hospitals for participation in the experiment.³ In accordance with the experimental protocol, "cards for each hospital in the total universe were arranged in order by bed size, type of ownership, and geographic location."⁴ Sampling fractions were determined for each bed size in order to produce the necessary sample. On the

basis of these sampling fractions, the number of hospitals necessary in each cell was determined, and a random selection was made of hospital cards in the corresponding cell.

Methods for Measuring Productivity

Methods provided by the LPC program and the Annual Productivity Questionnaire (APQ) were used for measuring productivity in this experiment.

The Labor Performance Control Program

The CASH Labor Performance Control Program was designed to provide the basis for measuring labor productivity both of a hospital and of its individual departments (labor cost centers).

Procedures. Under the LPC program, CASH engineers apply performance standards for each labor cost center in the hospital. These standards were developed by the use of stopwatch time studies, the application of predetermined time and motion data, and work sampling. (It should be noted that all standards are developed with due regard for the need to maintain appropriate levels in the quality of care provided. Elemental values are normalized, and allowances are made for personal fatigue and unavoidable delays. The standards are based on the traditional industrial engineering concept that equates a 100 per cent productivity index with the production level equal to a fair day's work.) A comparison of the standard hours required with the actual hours worked provides the hospital with a continual index of the degree of effectiveness with which labor is being used. This index is called the performance index (PI).

The LPC program recognizes that, while a certain percentage of hospital labor is necessarily constant, the greatest percentage is variable — i.e., it is dependent, to a degree, on census, number of tests, and case volume. Thus, for the purposes of data collection and for the application of standards, hospital labor centers are divided into three groups. Standards have been developed for cost centers in the first two groups, which are referred to as measurable cost centers, and have been somewhat arbitrarily established for the third group, which comprises nonmeasurable cost centers.

Cost centers in Group 1, which comprises approximately 90 per cent of the hospital's labor force, are those centers in which a major part of the

¹ *Incentive Reimbursement Experiment Protocol*, submitted to the U.S. Department of Health, Education, and Welfare by Blue Cross of Southern California, October 1, 1969.

² U.S. Department of Health, Education, and Welfare. *Reimbursement Incentives for Hospital and Medical Care, Objectives and Alternatives*. Research Report No. 26. Washington, D.C.: Government Printing Office, 1968, p. 74.

³ Twenty-six hospitals agreed to participate; however, one did not participate throughout the experiment.

⁴ *Incentive Reimbursement Experiment Protocol*, submitted to the U.S. Department of Health, Education, and Welfare by Blue Cross of Southern California, October 1, 1969.

workload varies from day to day. This group includes such cost centers as admitting, business office, dietary, laboratories, laundry, medical records, nursing, pharmacy, radiology, and surgery. In these areas, it is possible to use industrial engineering techniques to develop and apply performance standards.

Group 2, which comprises approximately eight per cent of the hospital's labor force, includes administrative offices, the emergency department, personnel, communications, maintenance, and purchasing. For this group, guideline standards have been developed that are related to bed complement and range of services provided.

Group 3, which comprises roughly two per cent of the hospital's labor centers, includes computer installations, public relations, social services, and duplicating. Inasmuch as the workload of these centers is not necessarily related to the size of the hospital or to other predictable factors, standard hours are established on the basis of the average performance index of measurable labor centers.

Implementation of the LPC Program in CASH-IRE. In implementing the LPC program as part of this experiment,⁵ a CASH representative met with the chief executive officer of the hospital to review and discuss the program's components and participation requirements. The hospital administrator then appointed a hospital program coordinator, who met with the CASH representative to discuss program requirements in detail. The hospital coordinator, usually with the assistance of the representative, oriented all department heads to program mechanics. He then coordinated activities related to obtaining and submitting to CASH the initial operating data necessary for instituting the program.

(It should be noted that proper implementation of the LPC program depends on the hospital's ability to furnish pertinent information relative to the operation of each labor cost center. Accurate reporting of operating information makes possible the development of performance standards that properly reflect the hospital's operating methods, conditions, and characteristics.)

During the initial implementation phase, supervisors in each labor cost center were required to record information daily, for a 28-day period, on

Statistical Data Record sheets. A composite of this information was then recorded on Standard Data Forms and used by CASH to calculate labor performance standards for each labor cost center. As a result of this procedure, standards were based on definitive tasks performed in each measurable cost center.

Once performance standards had been established, each hospital recorded, on a monthly basis, information regarding volume statistics and the actual hours worked in each labor cost center. This monthly report was the hospital's Activity Report. Using the labor performance standards and the activity reports, CASH produced monthly LPC reports for the hospital. These reports identified understaffing or overstaffing for each labor cost center in the hospital and also indicated performance trends, enabling supervisors to monitor the activities of their departments. The CASH representative analyzed the monthly reports for the supervisors, not only to identify areas requiring attention but also to assist in improving methods, procedures, and staffing.

To sustain the usefulness of the LPC program, it was incumbent on each hospital to report to CASH any changes in operating methods, conditions, or characteristics that might affect the original performance standards, e.g., the institution or termination of a service, the expansion of an existing service, or the change from hospital-employed labor to a contracted service. It was necessary, therefore, that hospital administrators thoroughly understand the bases on which labor performance standards were developed so that they would know when to report operating changes to CASH. When such changes were reported, a CASH representative would update performance standards accordingly.

Annual Productivity Questionnaire. In addition to the information submitted to CASH as part of the LPC program, each of the hospitals participating in the experiment also submitted to CASH an Annual Productivity Questionnaire. This questionnaire was submitted for each of the three incentive years and for the base year (the 12 months previous to the onset of the experiment). It recorded the bed complement, the total annual incurred payroll dollars and hours — including vacation time, sick leave time, and holidays — the annual incurred payroll dollars for each of the labor cost centers, and the annual volume of activity for each labor cost center. Any additions or deletions of services involving the hospital payroll during the year were also recorded. When CASH received the APQ from the hospital, copies were sent to HSSC with the

⁵ This description of experimental procedures is as delineated in the experimental protocol. Among the findings of this evaluation are incidents in which experimental hospitals, CASH, and HSSC deviated from the protocol.

request for an audit. HSSC performed all necessary audits and provided CASH with a report of the audit findings.

By applying the labor performance standards to the operating information submitted by the hospital on the base-year Annual Productivity Questionnaire, CASH calculated a base-year productivity index for each hospital. This base-year index was used in computing incentive gains or losses in the first incentive year. Incentive gains or losses for subsequent experimental years were based on the previous year's data. (It should be noted that, while CASH provided participating hospitals with monthly productivity indexes throughout the experiment, the year's final productivity index was computed on the basis of data from the audited Annual Productivity Questionnaire.)

Calculating Incentive Gains (Losses)

The Incentive Reimbursement Plan

Information from the APQ and from the LPC reports were major inputs into the incentive payment calculations. If a hospital's increased productivity resulted in a reduction of labor costs, the third-party payers shared the equivalent cost savings with the hospital in the form of an annual incentive payment. This incentive payment was in addition to the payments made by the third-party payers for services provided to their respective beneficiaries. The equivalent cost savings were the difference between the gross current year's payroll and the adjusted gross previous year's payroll. These savings reflected increased labor productivity and reduced labor costs. The incentive payment was made by participating third-party payers in shares based on the ratio of each payer's patient days covered to total patient days for the year.

(It should be noted that no penalty was provided for hospitals that decreased or maintained their productivity level. However, any losses resulting from a decline in productivity were carried forward for the three years of the experiment, offsetting incentive payments otherwise due.)

The Incentive Reimbursement Formula

The formula used to calculate incentive payments was: Medicare's (or Medi-Cal's or Blue Cross') incentive payment = adjusted previous year's payroll less the current year's payroll) x previous year's productivity index less Medicare's (or Medi-Cal's or Blue Cross') appropriate share of previous equivalent cost losses.⁶

A number of factors should be noted in relation to this formula. First, outpatient service and noncomparable cost-center payroll hours and dollars were excluded from the calculations. Second, the previous year's gross payroll was adjusted to compensate for the difference in operation between the two years. Adjustments were made for changes in volume — e.g., patient days, tests, or cases — standards changes, and changes owing to the effect of inflation on wages and fringe benefits. Third, when 50 per cent, or more, of a hospital's equivalent cost savings was attributable to pediatrics and/or obstetrics departments, adjustments were made in computing incentive payments. Such adjustments resulted from the fact that one of the participating third-party payers — Medicare — did not benefit from cost savings in these areas.

In order to encourage hospital administrators to maintain a properly balanced staff in all labor cost centers, the incentive share did not compensate for productivity indexes above 110 per cent. Thus, savings for labor cost centers were calculated up through that percentage. In instances in which productivity levels exceeded 110 per cent, appropriate adjustments were made.

Incentive Reimbursement Payments

On the basis of audit findings for both the base year and the incentive years, CASH submitted each hospital's completed incentive calculation material to HSSC for final review and determination of payment, if any. Since shares of the incentive payment were calculated on the basis of the ratio of patient days covered by each third-party payer, the hospital did not receive an incentive award for patient days not covered by one of the participating programs. When calculations were completed, the appropriate incentive payments were made to the hospitals that earned them. The hospitals were free to use incentive payments as they pleased.

EVALUATION DESIGN

The evaluation design described in this section of the report was developed to meet the following broad objectives which were stipulated in the evaluation contract and were based, in part, on experimental objectives:

“Evaluation of the effectiveness of the CASH methodology as to: (1) the experimental method — its appropriateness and implementation; (2) pro-

⁶*Incentive Reimbursement Experiment, 1969-1973*. Los Angeles: Blue Cross of Southern California, 1973.

ductivity changes — their nature in relationship to the experiment; (3) the impact of productivity changes on quality of care, utilization of services, and community acceptability; and (4) the value of the CASH method in relation to its cost of implementation and effectiveness of producing incentives and its ability to be generalized to other geographic areas.”⁷

Developing a Multifaceted Approach

Because of the complexity of the Incentive Reimbursement Experiment and because of the broad objectives outlined in the experimental protocol, a multifaceted approach to the evaluation project was considered necessary. Moreover, it was decided that, wherever possible, components of the evaluation would be treated and reported as discrete endeavors. In the discussion that follows, the components that make up the evaluation are described in relation to the stated experimental objectives.

The Experimental Method — Its Appropriateness and Implementation. The evaluation of the experimental method described in the previous section of this report was based on four component studies. The first study was a review and evaluation of the procedures used in selecting hospitals for participation in the experiment. It examined the sampling technique in relation to the purposes of the experiment being evaluated. In addition, sampling procedures were reviewed and evaluated, as were the statistical analyses that tested the representativeness of the sample. (See Working Paper No. 1 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.)

The second and third studies of experimental methodology examined the reliability and validity of data used in the experiment. The second study described and evaluated the audit process and procedures used by the Hospital Services of Southern California. Procedures were reviewed in terms of the charge to HSSC to verify data, supplied by participating hospitals, that were used to determine incentive gains (losses). Potential abuses of the experiment by hospitals were also considered in this aspect of the evaluation. In addition, estimates of the time and costs of conducting audits were made and evaluated. (See Working Paper No. 4 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.)

The third study had as its focus the system used by CASH to monitor and generally assess the validity of data submitted by hospitals. Similar to the audit study, this evaluation undertook to examine procedures used by CASH to ensure the reliability and validity of data submitted by experimental hospitals. Special attention was given to data that would subsequently be used in calculating incentive gains (losses). The study sought to identify actions that hospitals might take to maximize incentive payments. In addition, methods and procedures used by CASH in establishing and maintaining the Labor Performance Control program in hospitals were studied and evaluated. (See Working Paper No. 5 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.)

The fourth study examined the formula used for computing incentive payments (losses). This study was designed, generally, for evaluating the formula in terms of whether computations truly reflected actual cost savings (losses). In addition, this study examined the accuracy of data inputs into the formula and identified potential abuses that could go undetected in the use of the formula. (See Working Paper No. 6 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.)

Additional insight into the consistency and accuracy of data used in the experiment was gained from a component project designed to establish an evaluative data system for use, primarily, in conducting statistical analyses. (See Working Paper No. 3 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.)

Productivity Changes — Their Nature in Relationship to the Experiment. The nature of productivity changes and their relationship to the experiment were examined from several perspectives. Statistical analyses were made of hospital performance indexes and changes in those indexes over the course of the experiment. These analyses were used to examine relationships of performance index and change in performance index to occupancy, annual bed turnover, average length of stay, labor costs, bed complement, initial performance index, ownership, CASH representative time, and motivation. Department performance indexes were also examined to determine whether patterns of inter-hospital or intrahospital relationships existed. (See Working Paper No. 7 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.)

Significant aspects of the evaluation of productivity changes were incorporated in the report of case studies conducted in seven of the experi-

⁷ Contract #SSA 70-3037 between the U.S.A. and the regents, University of California, August 27, 1970, p.2.

mental hospitals. Personnel interviewed included the chief executive officer, administrative staff members, department heads, and, in some cases, a member of the medical staff.⁸ The hospital's CASH representative was also interviewed. Interviews were designed to provide input for assessing relevant attitudes and values of persons interviewed, gathering information regarding implementation of the experiment, identifying factors — intra- or extra-organizational — contributing to productivity changes, and assessing the extent to which the financial incentive had been a true motivator. (See *Incentive Reimbursement: Evaluation of an Experiment*, Part Three.)

Two studies were conducted to determine whether changes in productivity were, in fact, the result of experimental intervention. Comparative analyses were made to determine whether the productivity changes resulted from the LPC program and the financial incentive or whether they resulted from forces affecting all hospitals or from the well known "Hawthorne effect."

One approach was a comparison of the performance of experimental hospitals with that of a matched control group of hospitals, with a proxy variable used for labor productivity, in an attempt to determine whether differences in performance were discernible. In the second comparative analysis, an abbreviated method of computing labor performance indexes⁹ was used to compare experimental hospitals with a group of hospitals subscribing to the CASH LPC program and with another group that had no contact with CASH. The second comparison not only made possible an assessment of the relative changes in productivity among the three groups but also permitted some assessment of the effect of the financial incentive through comparison of experimental and LPC hospitals. (See Working Paper No. 8 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.)

The Impact of Productivity Changes on Quality of Care, Utilization of Services, and Community Acceptability. In the course of the development of the evaluation design, project staff members raised the issue of quality of care with both the project's advisory committee and the advisory committee of

⁸ Because of the complete turnover of administrative personnel in one hospital, interviews for that hospital were conducted with a former member of the administrative staff and with a CASH representative.

⁹ A formula developed by CASH for use in a statewide survey of labor productivity sponsored by the California Hospital Association.

the Hospital Research and Educational Trust. Both groups advised against an extensive evaluation of quality, inasmuch as the state of the art of assessing quality of medical care was thought to be less than adequate. Both groups advised that any more-or-less scientific attempt at evaluating quality would be a drain on resources and would produce little in the way of concrete results.

Advisers and staff did agree, however, that an attempt should be made to gain subjective evaluations of the level of, and changes in, quality of care provided in experimental hospitals — particularly in those demonstrating significant improvements in productivity. Therefore, questions directed at the quality of care issue were incorporated in the interview schedules used in gathering data for the case studies. (See Appendix A for a sample interview schedule.)

Provisions for evaluating the relationship between changes in productivity and the utilization of services were incorporated in the previously mentioned statistical analyses, and an empirical examination of departmental data relating performance index change to variation in demand for service over the life of the experiment was undertaken.

Evaluating community accountability — as stipulated in the experimental protocol — also proved problematic. In designing the evaluation project, staff members sought a definition of "community accountability" from the CASH organization, which the organization was unable to provide. The case study interview schedule, however, did incorporate questions for determining how incentive payments were used by the recipient hospitals. It was believed that the use of incentive payments might relate to the question of community accountability.

The Value of the CASH Method in Relation to Its Cost of Implementation and Effectiveness of Producing Incentives and Its Ability to Be Generalized to Other Geographic Areas. Two studies provided input for evaluating the effectiveness of the financial incentive offered in the experiment. These were the comparative performance studies just described and the case studies. (See Working Paper No. 8 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four, and the case study document, Part Three of the same publication.)

The question of whether generalization was possible was addressed in the evaluation of the sampling procedures and, empirically, in the analysis of experimental data and in the case studies.

While a separate technical paper was not written on the subject of cost benefits, a limited cost benefit analysis was conducted as part of the evaluation project. In this analysis, expenses incurred in conducting the experiment were examined in terms of cost savings that may or may not have been a direct result of experimental intervention. (See the next section.)

Presenting Evaluation Results. As noted in the foreword, four independent publications have been developed for presenting the results of the evalua-

tion project. In addition to this general summary and evaluation document, there are publications that present a review of the literature concerning incentive reimbursements, a report of seven case studies, and eight working papers.

This document includes not only a report of the results of the evaluation project but also summaries of the working papers, the case studies, and the statistical analysis. An overview of the literature review is included as an appendix. A glossary appears at the end.

MAJOR CONCLUSIONS AND RECOMMENDATIONS

Findings of the various component studies in this evaluation project resulted in a number of wide-ranging conclusions and recommendations related to the Incentive Reimbursement Experiment. While a definitive list appears later in this document, major conclusions and recommendations are presented here.

CONCLUSIONS

The major conclusions drawn from the evaluation project relate not only to specific aspects of the experiment — e.g., experimental methodology — but also to the general value of the experiment itself.

Specific Aspects

Organizational Factors Influencing Results

1. Attitudes regarding operating costs, efficiency, and effectiveness of management engineering techniques varied among hospital staff members. Moreover, these attitudes affected levels of understanding of the LPC program as well as the nature and extent of its use in improving labor productivity. In general:
 - a. Physician department heads demonstrated least concern with costs, efficiency, and effectiveness and perceived management engineering as of little or no value. Moreover, they exhibited low levels of understanding of the LPC program and, generally, successfully resisted attempts to improve labor productivity.
 - b. Nursing department heads were somewhat more concerned with costs and related matters than physician department heads. However, while they generally understood the LPC program, they invariably resisted its application.
 - c. Heads of large, "hotel-type or service" departments were generally most concerned with matters relating to operating costs. Moreover, they usually understood the LPC program and were the most receptive to, and the most frequent users of, the program.
 - d. Among clerical department heads there was

a wide variation both in attitudes and in the extent of understanding and use of the LPC program.

2. The variable but generally low managerial (as opposed to technical) competence among department heads, together with their tendency to give cost-effective operations low priority among their management concerns, constituted a significant factor in blocking improved labor productivity.
3. The inherent resistance to change of individuals and of formal and informal organizational groups presented a barrier to improved productivity.
4. The multiple lines of authority in a hospital, coupled with the separate professional orientation of key members of the work force, presented CEOs with formidable barriers — real or perceived — to accomplishing desired change.
5. The attitudes, values, self-perceived job security, and management styles of participating hospital chief executive officers were among the most significant factors influencing experimental outcome.
6. Support by the CEO was necessary, but support alone was not sufficient for improving labor productivity. Direct and persistent follow-up by the CEO or his designee was correlated with use of the LPC program and with related productivity improvements.

Experimental Methodology

7. If valid data are submitted on a timely basis, the LPC program is a useful and effective method of identifying understaffing or overstaffing in measurable cost centers.
8. CASH representatives are sufficiently well trained and experienced to assist hospital staffs in diagnosing staffing problems and to make recommendations for solving them.
9. Necessary requisites to conducting a CASH-IRE type of incentive reimbursement plan include: (a) the existence and maintenance of a bank of hospital work performance standards,

(b) the availability of properly trained management engineers, and (c) an automated data processing capacity.

10. Reliability and validity of experimental data were not ensured by the methods and procedures used in the experiment. The questionable reliability and validity of experimental data were the result of the limited scope of the HSSC audit and the lack of uniform guidelines and procedures for the CASH data review and monitoring system. Moreover, procedures did not fully assure equity to either participants or sponsors.
11. The reimbursement formula may have detracted from the potential motivational effect of incentive payments. The formula detected only those cost savings related to improved productivity and obscured other forms of labor cost reduction. Moreover, it did not directly relate awards to cost savings, and it negated extraordinarily high (above 110 per cent) productivity.
12. The LPC report provided a reasonably accurate and continuous index of the degree to which hospital labor was being utilized effectively.

Experimental Outcomes

13. Experimental hospitals and nonexperimental hospitals exhibited comparable changes in labor productivity and in related payroll costs over the three years of the experiment. (See the next section of this chapter for financial implications.)
14. Although hospital staffs frequently believed that labor productivity improvement was possible only at the expense of quality of services or care, there was no significant evidence that this was the case.
15. The factor most highly correlated with achieving increased labor productivity was the indicated presence of organizational cost consciousness prior to the onset of the experiment or the attainment of this concern during the experiment. (Participation in CASH-IRE in itself was not sufficient motivation to generate concern.)
16. Major influences on change in performance were subjective characteristics of hospitals, and, therefore, no explanatory or predictive generalizations can be made on the basis of

quantitative data available from this experiment.

17. Neither the offer nor the receipt of an institutional financial incentive was effective in motivating hospital personnel to improve labor productivity. (Because incentive awards were not shared with all or selected members of participating hospital staffs, it was not possible to determine whether individual incentive payments would have increased labor productivity.)
18. Critical incidents — extra- or intra-organizational — such as major construction projects, changes in top management, and government regulations significantly affected the nature and extent of hospital participation in the experiment. In some cases, these incidents had a more significant influence on experimental outcome than did experimental intervention.

General Value

The value of the Incentive Reimbursement Experiment is considered here not only in terms of financial costs and benefits but also in terms of the introduction of a new management technique and of the knowledge gained.

Financial Costs and Benefits

Conclusions drawn in relation to the financial costs and benefits of CASH-IRE vary, depending on assumptions made regarding cause and effect relationships, interpretations of savings, time frame considered, and perspective of the analyst. Several cost-benefit analysis approaches are presented here to illustrate the range of conclusions that might be drawn.

The most positive interpretation of the findings of IRE shows that, over the life of the experiment, labor cost savings totalled \$3,350,854 — whether or not such savings resulted from experimental intervention. These savings represented the three-year cumulative total (for the 29 hospital/year incidents of savings) of the differences between incentive and previous year payrolls, after adjustments had been made. (As noted earlier, adjustments included deductions for outpatient services¹ and for incomparability between depart-

¹ Third-party sponsors covered only inpatient days and, depending on whether the deductions for outpatient services were from areas with performance indexes greater or less than the overall hospital performance index, the overall hospital labor cost savings may have been more or less than \$3,350,854.

ments from one year to the next and adjustments made to previous year's payroll to reflect changes in wages or in volume of services.)

When the financial success of the Incentive Reimbursement Experiment is assessed, it is necessary to draw a conclusion concerning the cause/effect relationship between experimental intervention and the savings accrued over the three-year period of the experiment.

If it is concluded, as CASH and HSSC did conclude, that the cost savings resulted from experimental intervention, the experiment can be considered a success — "tangible cost savings generated by the experiment far outweigh the experiment cost."² On the basis of this conclusion, the extent of the financial benefit can be viewed from two different perspectives — that of the organizations conducting the experiment and that of the participating third-party payers.

From the perspective of the organizations conducting the experiment, the total financial benefit was \$3,350,854, less the cost of the experiment, \$1,556,211,³ or \$1,784,643. From the perspective of the third-party payers, the total financial benefit was considerably less. Since only the inpatient days covered by these third parties were included and since the inpatient days covered accounted for only 52 to 60 per cent of total days, the financial benefit was only \$338,267 ($\$338,267 = \$3,350,854 \times .56 - \$1,538,211$).

On the other hand, if statistical findings are used and the conclusion of the evaluation team, that cost savings were not the result of experimental intervention, is accepted, the experiment cannot be considered cost beneficial — particularly in view of the time frame of the experiment and of its strictly interpreted purpose. According to the findings of the statistical analysis conducted as part of the evaluation project, labor productivity and related cost savings in experimental hospitals were comparable to those found in other hospitals during the same period. As a result, third-party participants would have reimbursed participating hospitals approximately the same amount for services rendered to their beneficiaries during the three-year period,

² *Incentive Reimbursement Experiment, 1969-1973*, Los Angeles: Blue Cross of Southern California, 1973, p. 83.

³ Total experiment costs included: \$510,000 to fund the experiment, \$968,211 in incentive awards, and an estimated \$60,000 expended by HSSC. (An official of HSSC estimated its experiment-related cost at between \$50,000 and \$75,000. At the time of this report, these expenditures had not been charged to the contractor.)

regardless of whether \$1,556,211 had been expended for the experiment.

Findings of the case studies showed instances in which the LPC program had been used to detect and remedy overstaffing problems, thereby producing labor cost reductions. Since it was not possible to pinpoint all of the instances in which labor productivity improvements were attributable to the use of the LPC program, the financial cost benefits of this observation cannot be quantified. It is reasonable to assume, however, that once these labor productivity improvements have been implemented, they will endure and the cost savings derived will continue to accrue in succeeding years, benefiting the third-party sponsors, other third parties, and patients paying their own hospital bills. Therefore, in a longer time frame and through the accrual of labor cost savings, the experiment may prove to be an unequivocal financial success.

It is doubtful that, during the experiment, all the labor productivity improvements directly attributable to the LPC program produced cost savings that offset experimental costs. However, as suggested, the cost savings should continue to accrue, and, at some point beyond the experiment, savings may equal and then exceed initial costs.

Introduction of a New Management Tool

One of the major conclusions of this evaluation is that the LPC program can be an effective tool in improving labor productivity. This point is presented here, in view of the fact that CASH-IRE introduced this new and effective (if used) tool to the staffs of at least half of the participating hospitals. (Hopefully, this report and other reports of the experiment and the evaluation project will introduce the tool to others.)

Findings from this evaluation suggest the LPC program can be effectively utilized to identify areas in a hospital in which overstaffing or understaffing problems are present. Moreover, findings indicate that CASH representatives can be effective in recommending action that will help solve these problems. (By extension, the CASH organization and its other programs can be of aid in solving hospital problems. This discussion, however, is limited to the LPC program.)

Despite the LPC program's value as a management tool, there is ample evidence that implementation of the program, urging by the CASH organization, or, for that matter, the offer of a financial award for improvement were not sufficient to prompt use

of the LPC program. There is evidence, however, that in institutions in which there was interest, concern, and support for cost effectiveness, in combination with the necessary managerial competence to achieve it, the LPC program was effectively utilized in labor cost saving or containment efforts.

Thirteen of the experimental hospitals had not been affiliated with CASH prior to the onset of the experiment. To the extent that the management staffs of these hospitals were introduced to a useful tool, which some may later utilize to contain labor costs — either in their present hospitals or in other hospitals in which they are employed in the future — the experiment may be considered worthwhile.

Through CASH-IRE, participating hospital staffs were also introduced to the notion of incentive plans. While the concept of institutional incentives did not prove successful in this experiment, it is conceivable that introduction of this notion may promote interest in employee incentives, which have proved successful in industry and, to a lesser extent, in hospitals in improving cost effectiveness. In this sense, too, it may be concluded that the experiment was worthwhile.

New Knowledge

An obvious, but often overlooked, point is that a significant amount of knowledge gained, recorded, and presented would not exist if this experiment had not been conducted. Findings and conclusions from this effort not only provide insight into the effect of financial institutional incentives on hospitals and on the utility of one management engineering approach but they also provide considerable insight into factors that both facilitate and block organizational change in hospitals that is aimed at containing or reducing costs. The complexity of hospital operations and the difficult task of the chief executive officer in an institution that has multiple lines of authority are again underscored. The varying attitudes, values, and skills among top- and mid-level hospital managers, as they pertain to cost effectiveness, efficiency, management engineering, and so forth, have been more clearly elucidated as a result of conduct of the experiment. Finally, the Incentive Reimbursement Experiment has vividly portrayed the difficulty of achieving change in hospitals.

If these and other findings are used effectively in designing future reimbursement plans for hospitals or if they are in some way used on an industrywide or individual hospital basis to improve cost effec-

tiveness of operations, it may be concluded that CASH-IRE was a success because it contributed this knowledge.

RECOMMENDATIONS

Major recommendations growing out of this evaluation project relate mainly to general recommendations on experimental methodology and to specific recommendations for the replication of this experiment.

Experimental Methodology

1. Sampling experts and evaluation contractees should be involved in any experiment prior to its onset, in order to ensure that proper sampling enhances the possibility of statistical generalizations and to provide for sound evaluation research.
2. Experimental designs should include specified data validation procedures that ensure equity to sponsors and participants. Moreover, data validation activities should be conducted by an independent third party and be in accord with sound auditing and accounting principles.
3. Experimental designs should incorporate methods by which extra- or intra-organizational critical incidents can be detected and equitably accounted for.
4. Experimental designs should provide for the involvement of all levels of personnel at all phases of the experiment. In addition, such designs should include more comprehensive orientation sessions. Consideration also should be given to incorporating in the experimental design the necessary training sessions, particularly those for department heads and supervisory personnel.

Future Incentive Experiments

5. Favorable consideration should be given to replicating this experiment if the recommended changes set forth in this evaluation can be implemented.
6. Experimental designs should provide for covering all costs of hospital operations. However, if cost coverage is limited to labor costs, a method should be developed to ensure that all forms of reducing labor costs are accounted for when incentive awards are determined.

7. Future reimbursement experiments should incorporate in their designs methods by which hospitals can equitably distribute incentive awards to all or selected members of the hospital staff.
8. Alternative methods should be developed and tested for ensuring greater compliance with, and commitment to, participation in experimental incentive programs. More specifically, consideration should be given to:
 - a. Imposing negative sanctions (tied to incentives) for failure to comply with requirements for submitting data;
 - b. Imposing negative sanctions (tied to incentives) for failure to take action in departments that perform below a pre-specified level; and
 - c. Requiring that a labor productivity committee — with representatives of the governing body, medical staff, administration, and work force — be appointed and given the responsibility for formulating policy, establishing goals, reviewing compliance and level of participation, identifying targets for action, and determining extent and effect of accomplishments.

SUMMARIES OF EVALUATION COMPONENTS

This section of the report describes and summarizes the findings of the component projects on which the overall evaluation of CASH-IRE is based. These component projects include studies of the individual aspects of the experiment, a series of case studies, and a quantitative analysis of experimental data.

TECHNICAL PROJECTS

As noted earlier, the evaluation team used a multifaceted approach that focused on individual components of the evaluation as discrete endeavors. These discrete endeavors have been reported in separate papers, designed to stand as independent evaluations of selected components of the experiment. (For the convenience of the reader, these working papers have been published in one volume, entitled *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.)

Two of the working papers relate to the methodological aspects of the evaluation project itself: (1) the selection of a group of hospitals that was statistically matched to the experimental hospitals (a control group) and (2) the process of developing an evaluation system that was to serve as the basis for conducting selected descriptive and statistical analyses.

Four of the papers focus on the technical aspects of the experiment: (1) the experimental sampling technique, (2) the experimental auditing procedures, (3) the CASH monitoring system, and (4) the formula used in computing incentive gains (losses).

The final two papers relate to various analyses made: (1) performance comparisons between experimental hospitals and several selected groups of hospitals and (2) the quantitative analysis of experimental results.

The following pages present the summaries and conclusions of each of these component projects.

The Hospital Sample

As stated, one of the evaluation components was an analysis of the experimental hospital sample. This section describes and evaluates the sampling technique, its implementation, and the results that led to the final selection of the 26 experimental hospitals.¹

The Sampling Technique

The technique used by the Hospital Services of Southern California in developing the sample was based, in concept, on the probability sampling technique developed by Hess et al.² Each of the 296 hospitals in the sampling universe — all community hospitals in Southern California — was classified into one of 24 strata, on the basis of ownership, location, and bed size. A disproportionate sampling fraction was then determined for each bed-size strata that would produce the desired sample number, with appropriate representation from each bed-size group.

Evaluation of the Technique

In the evaluation of the sampling technique and its results, it was generally concluded that no experimental sample existed in the scientific sense of the word. Instead, the group comprised 26 hospitals that could be considered representative only of themselves and from which findings could not be generalized. This conclusion resulted from the compounding of major and minor problems, coupled with a somewhat arbitrary and unscientific sampling technique.

Included among the problems previously noted were:

- Errors in the original allocation of hospitals to the sampling strata that made possible the potential for sample bias;
- Failure to include any measure or control for size of hospital staff, in order to ensure representativeness of this factor, which is basic to the improvement of labor productivity;
- Incomplete application and, perhaps, understanding of the Hess technique;
- Arbitrary selection of a sample size that, in itself, made the process of generalization difficult, if not impossible; and

¹ As noted earlier, only 25 participated for the full test period.

² Hess, Irene et al. *Probability Sampling of Hospitals and Patients*. Research Series, No. 1. Ann Arbor: University of Michigan, 1961.

- Only partial validation of the sample's representativeness, in terms of cost characteristics.

The Control Group

A control group was selected for use in determining whether observed changes in experimental hospitals resulted from experimental intervention, the "Hawthorne effect," industrywide trends, or other factors.

The Matching Technique

Selection of this control group was based on a pair-wise matching technique. Twenty-five hospitals were selected from the Southern California hospital universe as controls for the 25 Southern California experimental hospitals. Statistical tests were conducted to determine the comparability of control and experimental hospitals, with respect to four variables: (1) bed complement, (2) occupancy, (3) full-time equivalent personnel per bed, and (4) full-time equivalent personnel per average daily census.

An empirical assessment of comparability was also conducted, in terms of hospital ownership and location. Results of both the statistical tests and the empirical assessment indicated the groups were comparable.

Problems Encountered

Widespread adoption of the CASH Labor Performance Control program among hospitals in Southern California precluded the possibility of selecting a control group "uncontaminated" by this significant experimental variable. An approximate split among LPC participants and non-LPC participants in the control group led to an analysis of paired groups. It was hoped that these groups would be statistically comparable, permitting isolation of the financial incentive. The significant differences found limited the potential value of this approach.

Despite the problems described, the control group was used in assessing whether changes had taken place in payroll costs per patient day, thus aiding in the determination of whether labor performance and cost changes observed were truly effects of the IRE program and not of industrywide trends or the "Hawthorne effect."

Comparisons were made between the performance of the experimental hospitals and the performance of the control group and other nonexperimental hospitals and then were analyzed. Results are

reported in a later section, "Comparative Performance Analysis Between Experimental and Nonexperimental Hospitals."

Evaluation Data System

An evaluation data system was developed to serve as the basis for examining statistical relationships among selected variables. The system, using data from the base year and the first incentive year, was developed to provide a data base for conducting proposed evaluative analyses. The analyses were to include, but were not to be limited to, the:

- Correlations between hospital performance index and changes in that index and such relevant factors as bed complement, occupancy, and base-year performance index;
- Relationship between changes in payroll expenditures and changes in performance index at the departmental level; and
- Contribution of individual departments to the overall change in the hospital's performance index — a search for interhospital and intra-hospital patterns.

Data Sources

Three sources of data were used in developing the data system:

- Annual Productivity Questionnaire, prepared annually by each participating hospital and submitted to CASH;
- Monthly Labor Performance Control reports, generated by CASH and forwarded to participating hospitals; and
- Annual Labor Performance Control reports, generated by CASH and forwarded to participating hospitals.

The second and third reports provided a form of feedback to the hospital, in terms of departmental and overall productivity levels.

Processing Data

Data from these three sources were edited, coded, and keypunched. In the case of the LPC reports, the process was reasonably straightforward and problem-free. However, processing APQ's for the base and first incentive years of the experiment proved to be a problem. One of the major

problems encountered was inconsistency between base-year and first incentive-year APQ figures. These figures included total hospital gross incurred annual payroll dollars and hours, along with departmental (or cost-center) gross incurred annual payroll dollars and annual volume. (Volume was presented in terms of statistical indicators, such as tests for laboratory or gross annual paid hours.) Among the inconsistencies found were: (1) cost centers reporting in one year and not in the other, (2) cost centers reporting separately in one year but combined in the other, (3) identical functions reported under different cost-center names, and (4) cost centers reported as hospital services in one year and as contract services in the other, without notation of date of change.

Because of the inconsistencies found, a computer program was written to test the internal consistency of the APQ payroll data. The individual departmental payroll figures were summed, and the sums were compared to the total figures reported by the hospital and audited by HSSC. The computer program found differences between the audited and summed figures.

It was concluded that the inconsistencies found in the APQ's were more a function of the inadequate manner in which the questionnaires were completed than of actual changes in departmental structure, accounting procedures, or service or of other legitimate reasons for inconsistencies.

It was concluded that both CASH and HSSC failed to review adequately the APQ data, some of which subsequently became input to incentive reimbursement computations.

Conclusions

Two separate findings led to the conclusion that it was neither feasible nor advisable to conduct an analysis of the relationship between departmental payroll expenditures and changes in departmental performance indexes over time. The first finding relates to the inconsistency between reporting of the base-year and first incentive-year departmental data on the APQ; this inconsistency was found to be more than marginal. The second finding relates to differences found between audited annual payroll figures and the summation of individual departmental payroll figures. It was concluded that the individual departmental figures were not accurate — thus, the decision was made not to conduct departmental analyses.

Findings from this undertaking at one and the

same time eliminated the possibility of conducting certain proposed evaluative analyses and underscored the need for conducting others. These findings particularly underscored the necessity for conducting an evaluation of HSSC auditing procedures and of the CASH system that monitored and validated hospital input and output data for LPC programs.

The Audit Process

The objectives established and the audit procedures used in verifying data supplied by the participating hospitals — data on which incentive payments (losses) were to be determined — were investigated and analyzed. (It should be noted that this analysis of the audit process was conducted during the second year of the experiment, at which time audits had been completed for the base year and the first incentive year.)

Development of the Audit Process

During the first incentive year of the experiment, meetings were held with representatives of HSSC, CASH, and SSA to develop auditing guidelines and procedures. As a result of these meetings, it was decided that the Annual Productivity Questionnaire, which was completed annually by participating hospitals and submitted to CASH, would serve as the basic audit source. Initial audit procedures and programs were prepared accordingly. It was estimated that one-half day would be required per audit.

After five audits had been performed on base-year data, it was found that the projected one-half day per audit was grossly inadequate. As a result, the scope of the audit was narrowed, and some of the responsibilities for the verification of data were shifted to CASH. After the shift of responsibilities — agreed to by SSA, HSSC, and CASH — data validation functions were distributed as follows:

1. CASH assumed responsibility for calculating incentives, with HSSC retaining review responsibility.
2. HSSC audited only those cost centers for which time standards had not been developed (nonmeasurable cost centers); cost centers for which time standards had been developed (measurable cost centers) were excluded from audit procedures. (It was reasoned that CASH would monitor the data submitted by hospitals on a monthly basis for measurable cost centers.)

3. HSSC operationalized its review responsibility by focusing audit procedures on specific portions of the Annual Productivity Questionnaire:

- a. Verification of total hospital annual payroll dollars and hours;
- b. Verification of nonmeasurable departmental annual payroll dollars and annual statistical volumes or payroll hours;
- c. Verification of patient day and delivery statistics; and
- d. Verification of the number of hospital beds and the square footage inside the hospital.

Review of the Process

An intensive review of procedures and completed documents showed that the audits conducted reasonably validated items 3a, 3c, and 3d. The review also showed that audit procedures were not sufficient to verify gross-incurred annual payroll and volume or payroll hours for nonmeasurable cost centers.

The validation of the figures submitted to, and monitored by, the CASH organization was deemed beyond the scope of this effort, inasmuch as it was concluded that the validity of these figures was totally dependent upon the adequacy of the CASH monitoring program, which is examined in the next section, "CASH Experimental Hospital Systems and Procedures."

Conclusions

With respect to the audit procedures, it was concluded that the validation of all figures used in computing incentive payments (losses) was not achieved — even if the CASH monitoring system had, in fact, validated the data it was responsible for reviewing. It was further concluded that the potential for abuse existed and that a hospital that chose to do so could, conceivably, manipulate figures to maximize incentive payment gains. It is important to emphasize, however, that the extensive review conducted of audit procedures and documents offered no suggestion that the experiment was being abused. Even so, it was recommended that, if widespread implementation of the experimental model were undertaken, audit procedures should be developed that could detect abuses.

In addition to reviewing audit procedures and documents, an assessment of audit manhours and costs were made. It was found that, on the average, it took 63 hours per hospital to conduct base-year audits. The comparable figure for first incentive-year audits was 106 hours. At an estimated rate of pay of \$9.33 per hour for an auditor's time, the average per hospital base-year audit cost was \$588, and the average first incentive-year audit cost was \$1,008.

CASH Experimental Hospital Systems and Procedures

This assessment of the role of the CASH organization was made in the context of whether third-party payers could, with some degree of assurance, rely on the techniques employed by CASH to ensure that incentive payments were based on real cost savings resulting from labor productivity gains. For the purpose of this discussion, the CASH role is divided into four major areas:

1. The initiation and operationalization of the LPC program — the systems and procedures used for input, evaluation, conversion, and output of productivity information.
2. The CASH data monitoring system — systems and procedures employed in reviewing and validating LPC input and output data.
3. The CASH standards revision and update procedures — the systems used to revise and update standards when appropriate changes, such as addition, deletion, or expansion of services, take place in hospitals.
4. The role of the CASH representative as liaison to IRE hospitals — his role in assisting hospitals to achieve labor productivity improvement.

Initiation and Operationalization of the LPC Program

Initiation and operationalization of the LPC program were defined by CASH as the control-period requirements. They began, following a hospital's decision to participate in IRE, with the orientation of hospital personnel, the collection, review, and analysis of base-line data, and the generation of base-year comparative data. A study of the documents and procedures employed showed that this function was conducted in accord with specifications of the experimental protocol. Data on workload and full-time equivalent employees in each

department (cost center) were reviewed for the propriety of units, representativeness of the 28-day data collection period, necessity for specially tailored standards, accuracy and documentation of volume levels, and so forth.

While there was no written, structured program on which to base the review and analysis, documentation exists of efforts made to verify the data and to adapt performance standards, where appropriate, to the unique circumstances of participating hospitals. The assistant director of CASH played a major role in reviewing workload data gathered during the 28-day (or one month) control period for each IRE hospital.

Data Monitoring System

The three remaining parts of the CASH role were defined by CASH as sustaining requirements. Review and validation of LPC program input and output data, or the CASH data monitoring system, were the responsibility of each individual CASH representative. The focus of this activity was the LPC report, a computer-generated monthly report. The review typically took the form of comparisons of the current report with the previous month's reports or a comparison with the report for the same month of the previous year.

Comparisons were also made between an individual hospital's report and a report on an all-participating hospital group, or some subset grouping of hospitals in the LPC program. The purpose of the monitoring system was to ensure that information submitted by hospitals was reliable and valid. A review of this aspect of the CASH role, however, showed that there were no established uniform guidelines or procedures for the CASH representatives to follow in monitoring the data. Moreover, there were no criteria for determining how much variance resulted in an investigation of reported data.

Findings

The CASH monitoring procedures were found to be highly subjective. Since some of the data submitted by the hospital were ultimately employed in computing incentive payments, it is particularly important to note that the subjective review did not begin to approach the rigor of standard auditing procedures. With the general lack of rigor in the monitoring systems and procedures, there can be no assurance that the data submitted by the hospitals were truly reliable and valid. In view of this, third-party payers could not truly be

assured that computations of incentive payments were based on real cost savings.

Standards Revision and Updating

While the CASH standards revision and update procedure was systematic in nature, when followed, it was also somewhat unstructured with respect to when reviews were to be conducted. The effectiveness of the review and update of standards depended, to a large degree, on the demands made by the participating hospital and by the monitoring of the CASH representative. Changes in hospital operation (e.g., service additions or deletions, new equipment, contract services, and so forth) that might have a direct relation to performance could go unnoticed if not discovered by the representative in his review or reported by hospital personnel. No master log or cross-reference index existed within the revision system to ensure that changes or revisions of one participating hospital would be applied, where necessary, to other participants in the experiment.

Once the need for a standards revision was identified, a standard procedure and a standard form were used to implement the change, retroactive to an appropriate date. Identification of the need for standards revision was left, in large measure, to the initiative of hospital personnel. Depending on the circumstances, failure to initiate requests for standards changes could work to a hospital's advantage or disadvantage, with respect to receiving an incentive payment. The CASH system was not designed to detect the need for standards revisions or to ensure that all appropriate revisions were made.

Role of the CASH Representative

As liaison with IRE hospitals, the CASH representative assisted hospital management to analyze monthly LPC reports, identified areas requiring attention, helped to improve methods and procedures, and assisted with resolution of staffing problems. The representatives were assigned to participating hospitals on the basis of bed size and geographic location, as well as on the basis of the representative's experience. Typically, the representative would visit each hospital once a month. Additional visits were made at the request of hospital personnel, usually the chief executive officer or the hospital's CASH coordinator. On occasion, requests for consulting services were initiated by department heads, usually those in large and labor-intense departments. Resolution of questions of accuracy or consistency of data and

responses to requests for standards revision were, by far, the most common focus of the CASH representative's visits to the IRE hospitals. It was found that frequency of visits by the representative tended to be a function of hospital-initiated requests for visits, of acceptance of the LPC program and data, and of receptivity to the representative's recommendations as well as to his personality.

Contrary to comments made by CASH management officials, it appeared that CASH representatives spent a proportionately greater amount of time in IRE hospitals than in other CASH hospitals. When data from a randomly selected 21-day period were examined, it was found that the CASH representatives assigned to IRE hospitals spent 33.9 per cent of their total time in these hospitals, while the hospitals represented only 15.3 per cent of the total number of hospitals for which CASH representatives were responsible.

Conclusions

The absence of written guidelines for uniform data handling techniques for the LPC program, coupled with the generally subjective nature of the data review conducted by CASH representatives, showed that the review was neither designed to be, nor does it approach the rigor of, an audit conducted in accord with accepted accounting principles. It was also apparent that intentional or unintentional hospital reporting errors could go undetected. Since detection of change and data validation could affect the incentive payment computations, it was recommended that more rigorous procedures be employed, and that, where data were used for computation of payments, those data be subjected to audit.

The Incentive Reimbursement Formula

The IRE formula for computing labor cost savings and incentive payments is complex. However, it can be summarized in two parts:

1. Cost savings = (adjusted inpatient previous year payroll) — (inpatient incentive year payroll);
2. Incentive payment = (cost savings) x (previous year's performance index) x (proportion of patient days covered by the participating third-party payers) — (previous equivalent cost losses).

In this formula, the inpatient payroll is the total

payroll minus those parts that can be attributed to outpatient visits or to cost centers not comparable from one year to the next. The adjusted inpatient previous year payroll reflects adjustments related to wage increases or to changes in standards³ or volume. The performance index is the ratio of standard hours to hours worked.

Computations

The computation of a cost savings was based on an increase in "productivity," as defined by the ratio of standard hours to hours paid. The magnitude of the savings varied with the size of the increase in productivity and the size of the payroll or, alternatively, with the average wage and the reduction in hours paid relative to standard hours. If there was a net cost savings (also called a net incentive gain), the hospital might earn an incentive payment for the current year. The amount of the incentive varied with the amount of the incentive gain and the previous year's performance index.

Problems Found

It was found during the evaluation that there was an inconsistency in the definition of productivity. The measure of productivity that was regularly reported (on monthly LPC reports) to the hospital was the performance index (the ratio of standard hours to hours worked). However, the measure of productivity reflected by the formula in the cost savings computation was the ratio of standard hours to hours paid. This inconsistency led to problems. On the basis of its monthly reports, for example, a hospital could be expecting an incentive payment, when, in fact, it would record an incentive loss.

In that the formula rewarded reductions in hours paid relative to standard hours, the specific emphasis of the experiment on the reduction in labor costs, resulting from increases in productivity, was satisfactorily reflected. However, it was noted that any labor cost-saving methods that reduced the overall hospital average wage — e.g., substituting less well-trained personnel for more well-trained or rearranging work schedules to reduce overtime — were obscured by the formula. Moreover, such methods could have decreased any incentive payment. In addition, the formula included no restrictions on increases in wages that led to higher calculated cost savings.

³ Labor performance standards developed for specified cost centers in each of the participating hospitals.

In this experiment, accuracy of both input data and calculations was essential to valid formula output. Audit and monitoring procedures were built into the research design. An evaluation of the audit and monitoring procedures designed to validate data input indicate that, while total hospital figures for payroll and hours were adequately reviewed, figures for hours worked and for payroll dollars, hours, and volume for individual cost centers (inpatient and outpatient) were not reviewed thoroughly enough to eliminate the possibility of error or abuse. The evaluation showed that it was possible for changes involving services or equipment that would influence standards to go unreported by the hospital and undetected in the monitoring procedures. In addition, nonstandard accuracy of computations could result in sizable dollar variations in an incentive payment. In such cases, incentive calculations could be affected.

The formula, together with the audit and monitoring procedures, allowed for the possibility of abuses by individual hospitals. Possible abuses included such things as increasing the performance index by over-reporting hours worked for non-measurable cost centers or improving the overall hospital hourly wage or labor productivity by inaccurate reporting of changes or judicious inclusion or exclusion of cost centers.

Other criticisms of the incentive calculations were found. Some participants believe that the calculations penalized hospitals that began with high performance indexes because increases were harder to achieve at a high level. The possibility was also noted that any motivational effect of a financial incentive could have been diluted or eliminated by the untimely payment of incentive awards and by the subtraction of previous years' incentive losses from subsequent gains — especially if a loss were large enough to require several years' gains to cancel it.

Comparative Performance Analysis Among Experimental and Nonexperimental Hospitals

Among the most important aspects of the evaluation was the determination of whether outcomes of the experiment were truly effects of the experiment or whether they were merely the effects of factors and conditions impinging upon the entire hospital industry or, more specifically, upon the California or Southern California hospital industry. In the experiment, each participating hospital's performance was measured annually. Improvement or decline was determined by comparing the incentive-year performance index with

the previous year's index. Improvement in performance and related cost savings were determined on this basis alone. As a result, when only experimental data were used, there was no way of determining whether participating hospitals performed differently from nonparticipating hospitals.

Selecting Comparison Groups

Ideally, the experimental design would have provided for two control groups, selected by a similar random or pseudo-random technique, to permit statistically valid comparisons at a later time. One group would have consisted of hospitals that had implemented the CASH LPC program but were offered no financial incentive for labor productivity improvements; the other group would have consisted of hospitals having no relationship with CASH or any of its programs.

Since such comparison groups were not selected at the onset of the experiment and since provisions were not made for the generation of comparable data for other hospitals, it was necessary to consider various alternative approaches. Two approaches were selected: one that permitted a comparison of IRE hospitals with other Southern California hospitals, in terms of changes in payroll cost, and another that permitted comparison of the labor performance of IRE hospitals with that of nonexperimental California hospitals participating in the CASH LPC program and that of other hospitals having no relationship to CASH.

Both approaches involved the selection of comparison groups and the use of analysis of variance procedures for comparison. The significance of difference between IRE and nonexperimental hospitals was determined at the $\alpha = .05$ level.

Following is a description of the selection of these groups, data and methods used in comparisons, and the results of those comparisons.

Approach 1. The previously described, statistically matched control group was used for comparing IRE hospitals and Southern California hospitals, in terms of changes in labor costs. It appeared feasible to use only readily available data. Therefore, the *Guide Issue, Hospital, J.A.H.A.*, was chosen as the data source. Change in payroll cost per patient day was selected as an indicator of achievement in controlling labor costs — the major objective of the experiment. Cost data for 1969, 1970, and 1971 were used to approximate the three-year experimental period. It should be noted that no adjustment could be made for changes in cost owing to wage or benefit increases.

Results of one-way analysis of variance procedures indicated that no significant differences existed between the group of IRE hospitals and the matched control group, in terms of increase in payroll cost per patient day.

Approach 2. The second approach involved the selection of two groups of hospitals for comparison with IRE hospitals: one group was chosen from the population of California hospitals subscribing to the CASH LPC program and the other from the population of California hospitals participating in the California Hospital Association's quarterly productivity survey. Hospitals chosen for the latter group had no relation at all to CASH. The criterion for selecting a hospital in either group was the availability of all required data — from either the LPC reports or the CHA survey — for a two-year period approximating the first and second years of the experiment. The groups compared were:

Group 1 — 25 IRE hospitals;

Group 2 — 43 nonexperimental hospitals subscribing to the LPC program; and

Group 3 — 31 nonexperimental hospitals with no CASH affiliation.

Developing Methods of Comparison

Comparisons among groups were made in terms of change in performance index, as an indication of the achievement of experiment objectives. Comparisons were also made of the number of beds, occupancy, performance level, and standard and actual hours per patient day, as an indication of basic similarity among groups. Data for the comparisons were compiled for each hospital from either CHA quarterly survey sources or the LPC reports. Performance indexes were computed by CASH, using the CHA survey methodology developed by CASH. Calculations were based on average time standards developed by CASH, which took into consideration volume, occupancy, hospital size, and the acuteness of patients' conditions.

Comparing the Findings

An introductory comparison of the three groups was made, using one-way analysis of variance procedures. Results showed that the three groups were similar in occupancy, performance levels, and standard and actual hours per patient day. The groups differed in average number of beds. However, it was believed that this difference would not affect the interpretation, inasmuch as the number

of beds was not significantly correlated with change in performance index for any of the three groups. The groups also differed in average change in performance index, with Group 2 having the smallest decrease in performance and Groups 1 and 3 having similar, larger decreases in performance index.

The similarity of Groups 1 and 3 indicated that the total experimental program had little effect on productivity change. Because all hospitals in Groups 1 and 2 were LPC participants, the difference between the groups in the change in performance seemed to indicate that the financial incentive had no positive effect on productivity change. The better performance by hospitals in Group 2 — all of which chose to participate in the LPC program — suggests the importance of a hospital's own motivation (or hospital-initiated motivation) in controlling labor resource allocations or in containing costs.

In order to isolate the influence of the financial incentive from that of self-motivation, CASH membership prior to the experiment was used as a proxy measure of self-motivation. IRE hospitals were then divided into self-motivated and non-self-motivated subgroups. Thus, four groups were available for comparison:

Group 1A — 12 IRE hospitals that had chosen to subscribe to CASH services prior to the experiment;

Group 1B — 13 IRE hospitals that had no relationship with CASH prior to the experiment;

Group 2 — 43 nonexperimental hospitals that were participating in the CASH LPC program; and

Group 3 — 31 nonexperimental hospitals that had no affiliation whatever with CASH.

The comparison of the experimental groups 1A and 1B substantiated the hypothesis of the importance of self-motivation, suggested by the earlier comparison. The motivated group 1A had a smaller decrease in performance index than the non-motivated group 1B.

The comparison of the self-motivated groups 1A and 2 permitted the isolation of the financial incentive and yielded the most important finding. No significant difference in the change in perfor-

mance index was found between groups 1A and 2, indicating the ineffectiveness of the financial incentive.

Summary

In summary, the results of the two approaches described in this report show that the existence of a financial incentive within the framework of the experimental program had no effect on the productivity or the payroll costs of hospitals. It can be concluded that any increases in productivity and decreases in costs that were achieved by experimental hospitals would very likely have occurred without participation in the experiment. It should be noted, however, that potential effects of a financial incentive may have been lessened or eliminated by (1) the long time lag between the achievement of cost savings and the receipt of the incentive award, (2) the insignificant size of incentives relative to hospital operating costs, and (3) the fact that the incentives were not directed to hospital employees.

The results of this evaluation suggest the overriding importance of self-generated interest in labor productivity improvement or in labor cost reduction or containment. It appears that a hospital's decision to subscribe to a program designed to increase labor productivity (in this case the CASH programs, including the LPC) is more important than the existence of an institutional financial incentive.

CASE STUDIES

While the original evaluation design had not included a case study project, the need for one became apparent immediately after the evaluation study began. It became apparent as a result of a thorough analysis of the experimental design, of observations made in participating hospitals, and of discussions with CASH representatives. The reasons for this need were twofold — the uniqueness of the hospitals and the fact that no negative incentives had been incorporated in the Incentive Reimbursement Experiment.

The 25 experimental hospitals ranged widely, with respect to bed complement, ownership, scope of services, medical staff specialization, occupancy rate, administrative staffing, sources and adequacy of financing, organizational structure, and so forth. (See Appendix C for a summary of hospital characteristics, together with a summary of each hospital's performance by incentive year.) Each hospital was unique, despite a common purpose of providing patient care. This uniqueness made an

individual evaluative approach necessary in the overall evaluation.

The need for an individual approach was underscored by the possibility that, suffering no penalties for poor performance, hospitals might vary greatly in the extent of their participation in the LPC program. It was reasoned that, under this strict positive incentive system, hospital participation might vary from total uninvolvement to the development of action-oriented programs designed to improve productivity. Subsequent observations in experimental hospitals corroborated this expectation. There appeared to be a wide variation in the perceived value of, and receptivity to, the experiment and an equally wide variation in the programs developed and operationalized in an attempt to improve labor productivity.

Seven case studies⁴ were conducted that focused on the structure and process of each hospital vis-à-vis the experiment, in an effort to: (1) determine the relationship of structure and process to experimental outcomes, (2) determine whether improvement in productivity could be attributed to experimental intervention, and (3) determine whether any such improvement had an effect beyond reducing operating costs. Thus, the case studies provided valuable information on the effectiveness of the CASH methodology, with respect to the experimental method and to productivity changes, in addition to providing some insights concerning the effect of productivity changes on quality of care, utilization of services, and community accountability. Insight was also gained on the value of a financial incentive in motivating change and on the extent to which the LPC program was used.

As planned, the case studies consisted of three major activities — on-site visits for indepth interviews with selected hospital staff members, indepth interviews with CASH representatives, and an indepth review of data generated from LPC reports. Summaries of the seven case studies follow.

Hospital A

Hospital A, which is located in a small city in the southern part of California, is a physician-owned, short-term general hospital. At the beginning of its participation in the Incentive Reimbursement Ex-

⁴ The seven hospitals selected for case studies were selected, insofar as possible, to be representative of the sample of 25, in terms of bed size, ownership, location, and experimental outcome.

periment (IRE), conducted by the Commission for Administrative Services in Hospitals (CASH), Hospital A had 52 beds. By the end of the experiment, it had 159 beds.

For the first incentive year of the experiment, Hospital A increased its performance index almost one per cent and earned an incentive award of \$3,375. In the second and third incentive years, the hospital's performance index declined, and net total losses were computed in the amounts of \$48,106 and \$25,215, respectively. Hospital A was in a state of enormous flux during the last two years of the experiment. From the first to the third incentive year, the hospital's patient days doubled, and the inpatient payroll increased almost two and one-half times. There were related increases in actual and standard hours.

Influencing Factors

A number of factors had influenced Hospital A's performance during the course of the experiment. The most obvious, and probably the most significant, was the tripling of the hospital's bed complement in the middle of the second incentive year of the experiment. It was reported that the new construction did not affect the operation of the old facility. However, excessive staffing in the face of gradual growth in occupancy had obvious implications for the labor productivity of Hospital A. Study reports show that the CASH representative spent considerable time in adjusting standards — attempting to identify hours worked as related to the addition of beds — and in identifying other situations that required standards or hours-worked adjustments.

It was also reported that a perceived threat of unionization in the early part of the third incentive year resulted in a delay in planned staff reductions, particularly in the Nursing and Housekeeping Departments. It should be noted that, toward the end of the third incentive year, the housekeeping staff had been cut by approximately four full-time equivalent personnel, whereas the nursing staff had actually increased. Other factors mentioned as possible influences were a change in CEOs, an over-abundance of beds in the area in which the hospital was located, and the fact that Hospital A had not previously been a CASH subscriber.

Because of special circumstances, the established procedure developed for case studies was not used for Hospital A. Subsequent to the selection of this hospital for a case study, it was learned that there had been a recent change in chief executive officers

and a widespread turnover in department heads. As a result, no one was available for an interview who was familiar with the hospital's participation in the experiment. In view of this situation, the assistant director of CASH recommended that a former CEO — the one who had held that position through the termination of the experiment — be contacted and interviewed. While this former CEO was considered to be the best qualified to comment on the hospital's involvement, he had not been with Hospital A during the first 18 months of the experiment. This individual had been appointed assistant administrator in June 1971; he became CEO in November 1971 and stayed through the termination of the experiment.

Involvement With CASH-IRE

A further complication arose. There had also been a change in CASH representatives assigned to Hospital A during the experiment, and only the second one was available for interview. As a result, only two persons were interviewed with respect to Hospital A's participation in CASH-IRE.

Both the former CEO and the CASH representative were asked for their perceptions of the hospital's involvement in CASH-IRE during the first 18 months. While quite different explanations were provided, there was consensus that the involvement of the hospital during this period had been extremely limited and accomplishments were nonexistent. The former CEO stated that he was not aware of the manner in which CASH-IRE had been introduced in the hospital but that "little had been done with the program, vis-à-vis the hospital's operation," prior to his assuming the job of assistant administrator. He said, "I had to start from ground zero." He indicated further that the reason for the hospital's lack of involvement had been his predecessor's lack of orientation to the concepts of efficiency and effectiveness and, more specifically, to the application of industrial engineering techniques. He did say, however, that his predecessor had been concerned with cost effectiveness and had tended to "preach to" his department heads, encouraging them to be more productive.

The CASH representative reported that the standard orientation to CASH-IRE had been conducted in Hospital A. The assistant director of the CASH organization had oriented the chief executive officer, and, subsequently, orientation sessions had been held for department heads, both as a group and individually. The CASH representative reported that no actions had been taken to improve

labor productivity that could be related to the LPC program or to its data during the first 23 months of the experiment. He explained that, during this period, the first CEO had been receptive to the experiment up to the point that recommendations for staffing reductions had been brought to his attention. The representative noted that he had worked with the first assistant administrator in identifying low-performing departments and in developing recommendations to achieve greater labor productivity. However, the representative explained that he was told by the CEO that the hospital's owners were not willing for him to reduce staffing in the institution.

The CASH representative reported that, in June 1971, the soon-to-be chief executive officer had been hired by Hospital A as assistant administrator. The representative stated that the new assistant administrator had expressed a strong desire to cooperate but "nothing was really done." He added that the previously made suggestions and recommendations were still appropriate at the time of the new assistant administrator's arrival but that no action had been taken on them. The interviewee said he suspected that the CEO had continued to resist recommendations for reduced staffing, despite any interest on the part of the new assistant administrator. The representative reported that he had lost contact with the assistant administrator when the latter was named chief executive officer in November 1971.

The representative perceived the new CEO as being so overwhelmed with his responsibilities that he was unable to involve himself with the LPC program. The representative stated that it was not until the end of the third incentive year of the experiment that some action was taken. He indicated that, at this point, the LPC program and its data were used and that actions were taken to improve labor productivity. These actions, he said, had been reflected in the improved performance indices of several departments. The representative said he did not know whether actions taken had been precipitated by a change in attitude among the owners or whether the new CEO had initiated them independently.

In a contradictory statement, the former CEO reported that, during the period from August 1971 to February 1972, the LPC program had been the principal method by which labor resource allocations were controlled in the hospital. However, he was unable to provide concrete examples of how the program had been used during this period, despite persistent probing. The CEO stated that,

effective February 1972, a sophisticated budget procedure that he developed had been introduced in the hospital. Subsequent to this date, the LPC program had not been used at all. The CEO indicated that more cost-effective operations had been achieved, once the budget system had been instituted, and that improvements had been made in the use of labor resources during this period, which corresponded to the end of the third incentive year of the experiment.

Use of the LPC Program

The CEO and the CASH representative had quite opposite recollections concerning the nature and extent of the use of the LPC program in the last half of the experiment. They had common recollections that improvements in labor productivity were made at the end of the third incentive year. The difference in their recollections concerned the method by which these improvements were accomplished. The former CEO suggested that the accomplishments were the result of the implementation and use of a sophisticated budget system; the CASH representative suggested that they were the result of the effective use of the LPC program.

Review of Performance

The former chief executive officer and the CASH representative were both asked to comment on the performance of several departments during the life of the experiment.

In response to questions concerning the variable and declining performance index in the *Business Office* during the experiment, the former CEO explained that services had been expanded and the quality of service had been improved. The interviewee estimated that, during the second and third incentive year of the experiment, two or three clerks had been added to monitor government programs, two or three insurance clerks had been added (personnel from a temporary service), and one person had been added to assist in a major effort to reduce accounts receivable. The CEO indicated that no effort had been made to use the LPC or its data in the Business Office.

The Business Office's improvement from 78 per cent in the base year to 85 per cent in the first incentive year was attributed by the CASH representative to the use of the LPC program by the assistant administrator. The CASH representative stated that the first assistant administrator had taken steps to improve labor productivity in this area during the first incentive year. He attributed the continued improvement — to 89 per cent in the

second incentive year — to the efforts of this assistant administrator. The decline to 77 per cent in the third incentive year, the representative explained, was the result of efforts to improve the very poor accounts receivable situation. When asked whether requests had been made for adjusting standards to reflect expanded service in the Business Office, the representative responded that, after the move into the new building, the Business Office was among the departments for which standards had been revised and revisions were made retroactive to an appropriate date.

The former CEO's explanation for the *Laboratory Department's* consistently low and somewhat variable performance was that the chief pathologist was a member of the hospital board and a major owner of the hospital. Therefore, he had free rein to operate his department. The former chief executive officer stated that the chief pathologist was aware of the LPC program and of his department's low performance index but was not willing to use the program. Apparently, the CEO had been unwilling to confront him on this issue.

The CASH representative reported having had little contact with any of the physician department heads, including the head of the laboratory. He commented that these departments had been "just riding the waves" and had totally disregarded the LPC reports.

The former CEO explained the variable and low performance of the Radiology Department on the basis of its having expanded services and staff. He implied that more services were being provided and that net labor costs had been reduced. This had resulted when a second shift had been instituted and when call-back and on-call time had been cut significantly. The former CEO commented that these achievements had not been accounted for by the LPC program. He added that the Radiology Department had been a major revenue producer and, as measured by the hospital budget indicators, had been a most satisfactory performer. Emphasis was added here with reference to the fact that the budget had been the determinant of resource allocation, not the LPC program. At no time, in fact, was mention made of the use of the LPC program in the Radiology Department.

The CEO explained the significant drop in the *Medical Record Department's* performance index — from 82 per cent in the first incentive year to 67 per cent in the second year to 56 per cent in the third year — as resulting from a substantial expansion in services and staff and from improve-

ment in the quality of medical records. Included among expanded services, he said, were the central dictation unit, the central archives, and the hiring of a full-time medical staff secretary to work with various medical staff committees. The explanation for the improvement in the quality of medical records related to the completion of a great number of outstanding records and a general improvement in the content of the records, in preparation for a joint survey by the Joint Commission on Accreditation of Hospitals and the California Medical Association. (It has been noted that the hospital had failed to pass the CMA phase of the survey once before, mainly because of its medical records.)

The CEO was unable to recall whether changes in standards had been requested or made to account for the expansion and addition of services in this department. According to the former CEO, the LPC program and its data had not been used at all in the Medical Record Department.

The CASH representative explained that the improvement in the Medical Record Department's performance index during the first incentive year had resulted from an increased number of discharges and an increase in the related standards hours, without a concomitant increase in hours worked. He explained that, with the move into the new building, staff expansion had been undertaken without concern for variable staffing — thus, the decline in performance index to 67 per cent in the second incentive year and to 56 per cent in the third. The representative said that standards changes had been made. He stated that, with the move to the new building, revisions had been made that included provision for the addition of a transcription service and that these revisions had been made retroactive to an appropriate date.

In response to questions concerning the *Nursing Department*, the former CEO stated that, while he had been assistant administrator responsible for the CASH program, the Nursing Department had been a principal target of his early efforts. He reported that the nursing administrative and supervisory hierarchy had rather strongly resisted the CASH program. As a result, he said he had chosen to orient these nursing personnel to statistical or quantitative concepts, rather than to emphasize the LPC program per se.

He reported that, after assuming responsibilities as the CEO, he had urged his nursing service director and the assistant director to visit two local hospitals. One of the hospitals was actually using the

CASH program. The other had developed and was using a nurse staffing pattern based on a level-of-patient-care concept. These visits, together with the CEO's urging, were reported to have precipitated the nursing administration's first willingness to consider using a nursing-hour-per-patient-day figure to control allocation of nursing staff. The interviewee stated that a 4.8 hours-per-patient-day figure modified CASH staffing figure had been set as a target for the Nursing Department. This action, together with a number of changes in the organizational structure of the department, was reported to have greatly improved labor productivity, as well as quality of service. Further action was taken when the new budget system was introduced. The former CEO reported that the nursing service director had been allocated a flat dollar-per-patient-day cost figure and that the nursing administration could staff the service in whatever manner it saw fit within this dollar limitation.

The interviewee reported that CASH-IRE had played a very small part in the activities just described. He explained that the standards had been perceived as unacceptable — hence, unachievable. He added that, at best, the LPC data had been used as verification of improvements made, primarily, during the last incentive year of the experiment. "We were more concerned with our own devices and would have achieved whatever we did with or without CASH."

The CASH representative offered some contradictory opinions. He stated that he had worked with the Nursing Department; the nursing service director had recognized, in the early stages of the experiment, that her department was overstaffed and had reported this to the CEO. The CEO had not been willing to reduce staffing. The Nursing Department's improvement in performance index during the first incentive year was explained by the representative in terms of an increase in patient days, without a commensurate increase in hours worked. The decline in performance index during the second incentive year he explained in terms of the department's inability to use variable staffing techniques. He said the improvement in the third incentive year had resulted from hospital-wide attempts to improve labor productivity and from the successes achieved, primarily, toward the end of the third incentive year of the experiment. Contrary to comments of the former CEO, the CASH representative implied that the LPC program had been employed in these late third-year efforts.

Conclusions

Because of the often conflicting points of view offered by the former chief executive officer and the CASH representative interviewed, it is difficult to reach other than very general conclusions about Hospital A's involvement in CASH-IRE. However, it may be reasonably concluded that:

1. At no time during the experiment did the financial incentive motivate administrative or department head personnel to take actions to improve labor productivity.
2. With the possible exception of the Business Office, the LPC program was not used effectively to improve labor productivity through the first 18 months of the experiment.
3. The LPC program and its data may have been used on a limited basis in the last 18 months of the experiment to retard or control declining labor productivity.

While Hospital A presented a very unusual combination of almost bizarre occurrences over the three-year period, this case history is useful in illustrating the extent to which unanticipated events can influence the experience of a hospital participating in an experiment.

Hospital D

Hospital D is a short-term, general hospital, located in a large urban area. The hospital has 293 beds and provides a full range of medical-surgical, obstetrical, and pediatric services. During the course of the three-year incentive reimbursement experiment, Hospital D had two different administrators.

Because of its exceptional performance, Hospital D was selected for a case study. The focus of the on-site visit was to determine how the hospital had been able consistently to improve its labor productivity and to determine the extent to which the LPC program and the financial incentive had contributed to the hospital's accomplishments.

Hospital D also presented the opportunity to explore a hospital in which a change in management occurred. (There were several such hospitals among the 25.) A new chief executive officer had been hired and many department heads and supervisory personnel had been changed at the beginning of the second incentive year. As a result, interviews

conducted in this hospital concentrated, for the most part, on the second and third incentive years of the experiment. Insight into the hospital's experience during the first incentive year was gained, primarily, through an analysis of this experience made by a former administrative resident at the hospital. The former chief of the medical staff also was interviewed.

Two CASH representatives had been assigned to this hospital during the experiment. The first had been the representative assigned to the hospital prior to the onset of the experiment; he remained through the end of the second incentive year. The second representative assumed his responsibilities beginning in the third incentive year and remained as representative after the experiment had been concluded. Interviews were conducted with both of these individuals regarding their experiences with Hospital D.

Previous CASH Affiliation

Hospital D had been a subscribing member of CASH prior to the onset of the experiment. The hospital was described as a "club member," which is CASH jargon for a hospital that is, essentially, a non-participant. The first CASH representative commented that, in the two or three years prior to the onset of the experiment, he saw the CEO only one time. He described the director of nursing as extremely opposed to the pre-CASH-IRE programs. He pointed out that at least the chief executive officer and the director of nursing had been exposed to CASH and its methods prior to the experiment, even though the exposure was limited.

Orientation to CASH-IRE

Orientation to CASH-IRE had followed the standard format. The director of CASH and the CASH representative had oriented the CEO and members of his administrative staff. Subsequently, department heads had been oriented in a mass meeting, and meetings had been held by the CASH representative with individual department heads. It was reported that the CEO had diligently attended all orientation sessions, including those with individual department heads, and that this was illustrative of his enthusiasm for the experiment. The CEO was said to have made a concerted effort to engender enthusiasm for the experiment among his department heads. Continuous efforts had been undertaken in an attempt to assure that department heads thoroughly understood the basis for the LPC program, the meaning of the data generated, and the possible uses of the program.

The CASH representative had been requested to conduct a second orientation session approximately six to seven months after the onset of the experiment. According to the CASH representative, it had been after this orientation session that department heads had begun to have a reasonably good understanding of the LPC program.

Involvement With CASH-IRE

During the first incentive year, department heads had been requested to establish performance index targets for themselves and to provide explanations of how they intended to achieve these targets. Moreover, an assistant administrator had developed a form for monthly distribution to department heads that included relevant LPC data. It was reported that the assistant administrator had monitored and followed the accomplishments of the department heads during the first incentive year, encouraging them to improve.

Despite these efforts, a survey conducted at the close of the first incentive year by a former administrative resident indicated some misunderstanding of the LPC program, together with a general belief that the program was of little use to departmental operations. Survey findings had included the fact that all department heads and supervisors were aware that the hospital was participating in the experiment. Findings had also indicated that: (1) 30 per cent of the respondents believed the performance index was of value to them, but only 20 per cent said they had referred to their reports more than once a month; (2) 80 per cent of the respondents said they did not believe that changes in the performance index reflected a real increase or decrease in labor productivity, and (3) only 20 per cent of the respondents said they thought that the base-year standards had been correct. The CASH representative commented that the department heads generally had resented the LPC program and that the resentment may have been caused by the pressure placed on them by the CEO to improve performance indices.

All sources of information on the hospital's first incentive-year experience had referred to the hospital's financial difficulties and to its concern with operating costs. None of the information sources, however, could relate use of the LPC program or the offer of a financial incentive to the accomplishments of Hospital D during the first incentive year. With the exception of the administrative resident, hospital personnel had concluded that the improved labor productivity had been a reflection of

the general cost consciousness that permeated the institution and had been the result of the financial difficulties experienced by the hospital. On the basis of the fact that the hospital had had approximately 3,000 more patient days in the first incentive year than in the base year of the experiment, the administrative resident had concluded that the improved labor productivity was a result of an increase in demand for service that had not been accompanied by related staffing increases.

Influencing Factor

Coinciding with the onset of the second incentive year of the experiment, a new CEO had been employed at the hospital. Various interviewees implied that this very financially oriented hospital administrator had been selected with the aim of improving the hospital's still serious financial situation. Because the hospital had previously experienced difficulty in meeting payrolls and in paying suppliers on a timely basis and because it had been unable to purchase equipment requested by the medical staff, the new CEO had received the full support of the board of directors and the medical staff. He had been authorized to take whatever reasonable actions were necessary to improve the hospital's financial position.

General Experience

The new CEO had been unaware that Hospital D had been a subscriber to CASH prior to the experiment. Although the CEO had perceived industrial engineering techniques as a tool that could significantly decrease operating costs in the hospital industry, he had commented that "common sense and the desire to reduce staff could produce comparable results." Despite improvements made at Hospital D during the experiment, the CEO expressed the belief that there was still room for additional improvement.

It was reported that this CEO had not made direct use of the LPC program to accomplish results during the course of the experiment. Because he was most concerned with "bottom-line" items on financial statements, his style had called for establishing performance improvement targets for the overall hospital, in terms of achieving more favorable relationships among bottom-line items. Similar targets were then negotiated with subordinates for their areas of responsibility.

The CEO estimated that he had spent approximately one hour per month on CASH-IRE but had spent very much more time on overall problems of labor control. According to the CEO, he had attempted to sell the CASH program to a less than

enthusiastic staff. He had seen the program as a means of promoting greater concern for labor productivity and of inducing department heads to use the data as a management tool. The CEO also reported that his immediate subordinates may have used the LPC reports and data as leverage to encourage department heads toward greater labor productivity. It was noted that the concern had not been with the actual level of productivity but with whether there had been improvement. The administrative staff had also been more concerned with whether the performance index verified progress toward previously established bottom-line financial statement goals than with the performance index per se.

The former chief of staff said he believed that efficiency and effectiveness had been improved, with no negative effect on quality of patient care. But he regarded this improvement as a result of the change in personnel at Hospital D, rather than as a result of the CASH program.

The two CASH representatives described very different experiences with Hospital D during the second and third incentive years of the experiment. The first representative described the CEO as "very egotistical and unwilling to accept anything from CASH, believing his own judgment was better than any judgments CASH had to offer." The CEO was perceived by this individual as being unhappy that he had been caught in the experiment and more concerned with "how to get around it than with how to work with it." The representative stated, "He was totally detached and did not want to know about it [the experiment]. . . . I had few contacts with the CEO, and they were all negative."

Beginning the second incentive year, and with the appointment of the new CEO, there had been a complete reversal of this CASH representative's relationship with the hospital. In the first incentive year, he had had some contact with most departments and had made some attempt to encourage more productive use of labor. The Nursing Department had been singled out as a major exception, because the director of nursing had strongly resisted CASH programs. Moreover, the CEO had requested the CASH representative not to attempt to work with this department.

Once the new CEO had taken over, the CASH representative indicated that he had had little contact with any department other than nursing. It was explained that a new director of nursing had been hired and that a consulting firm had been retained to study nurse staffing and to make recommendations for improvement. The consulting

firm had urged the director of nursing to consult with the CASH representative to determine proper nurse/patient staffing ratios. The CASH representative had, subsequently, worked at length with the director in developing a ratio of between 4.5 and 5.0 nursing hours per patient day, including clerical personnel hours.

Improvements made in the Nursing Department during the second incentive year of the experiment were attributed to the foregoing actions. Because of the CASH representative's lack of contact with other departments during the second incentive year, he was unable to attribute any other accomplishments to the LPC program.

The CASH representative assigned to Hospital D during the third incentive year described a very different relationship with Hospital D. Moreover, he described the hospital as an effective user of the LPC program — as effective, in fact, as any hospital he had worked with. Although the second representative had spent little time with the CEO, he described him as having a firm grasp of the program and as being a staunch supporter of it. Most of the representative's contact with the hospital during the third incentive year of the experiment had been at the assistant administrator level. He reported that assistant administrators had used the LPC program as a tool to accomplish goals they had negotiated with the CEO. According to the CASH representative, once the assistant administrators had negotiated targets with the CEO, they would in turn, negotiate similar targets with their department heads. These assistant administrators had used the LPC data to identify areas that could be improved. They had also used it as one measure of whether objectives had been achieved.

The representative who had been assigned to Hospital D in the third incentive year of the experiment described department heads as having been less than enthusiastic about the LPC program. Moreover, he said they seemed to have had little understanding of it. The representative had undertaken to reorient and educate these department heads. For the most part, the department heads did not initiate use of the LPC until after the experiment was over.

With the polar descriptions of Hospital D's involvement in the experiment during the second and third incentive years of the experiment, it would almost appear that two different hospitals were being described. Possible explanations include a personality clash between the first representative and the new CEO, which may have caused the

representative to avoid any contact with the hospital until the new director of nursing requested assistance. In addition, it is possible that the new CEO had a number of specific objectives that he intended to accomplish in his first year and that his full attention was given to these objectives during that period. If the LPC program had been perceived by staff as having little utility in accomplishing these objectives, the CEO may have thought the program and the representative were a nuisance. If this hypothesis is correct, the CEO might then have turned to the LPC program after his first objectives had been accomplished, perceiving its value as a tool in the third incentive year of the experiment.

All of this may explain the negative perceptions of the CEO in the second incentive year and the comments that the LPC program had not been used except in the Nursing Department. The foregoing might also explain the second representative's positive attitude toward the new CEO and his description of the relatively active use of the LPC program.

Review of Performance

Indepth interviews were conducted in relation to five departments in Hospital D. In addition, explanations were sought from the CASH representatives and from the CEO for the performances of these departments during the experiment. An explanation had been sought for the *Nursing Department's* improvement in performance index from 69 per cent in the base year to 82 per cent in the third incentive year. There had been great surprise about, but no explanation for, the Nursing Department's improvement from a performance index of 69 per cent in the base year to 75 per cent in the first incentive year. The director of nursing during this period had been described as adamantly opposed to the application of any CASH programs in the Nursing Department. This opposition, coupled with a request by the CEO that the CASH representative not involve himself with this department, suggests that the improvement in productivity in this department cannot be attributed to the LPC program. When the data available are examined, it appears that, during the first incentive year of the experiment, there were approximately 10 fewer full-time equivalent employees in the department. At the same time, there was an increase of about 3,000 patient days, thus explaining the six percentage point improvement in performance index.

A new director of nursing was appointed during the second incentive year. Upon assuming this

responsibility, she established an appropriate ratio of nursing hours per patient in each unit within the department. The CASH representative assisted in this task. Once the ratios had been established, a position control system had been developed.

Following these actions, the director of nursing reported that the LPC program had not been used on an ongoing basis thereafter but, rather, efforts had been made to adhere to the established nursing hour ratios and to maintain conformance with the position control system. Thus, in some measure, the improvement in the department's performance index in the second and the third incentive years can be attributed to the initial use of the CASH data and to the consulting services of the CASH representative.

Actions taken in the Nursing Department were limited to those taken by the director and by supervisory personnel. Nursing staff personnel had been aware of the acronym CASH but had not been familiar with the programs. The nursing staff was very much aware, however, that staffing had been reduced, but nurses reported they did not believe that the quality of nursing care had suffered. They did indicate that they had less time to administer to the personal needs of patients after changes had been made in staffing patterns. A member of the hospital medical staff commented that the efficiency and effectiveness of the department and the quality of nursing care had, in fact, improved during the life of the experiment.

The *Dietary Department* had registered an 85 per cent performance index for the base year of the experiment. It had improved each succeeding year and, by the end of the third incentive year, had a performance index of 115. Early in the first incentive year of the experiment, the hospital had contracted with a private firm to provide dietary services. It was reported that a very favorable contract had been negotiated under which the hospital paid the contractor a fixed fee per patient day. The staff of the department had been employed by the hospital, and the contractor had reimbursed the hospital for payroll costs. Because of that very favorable contract, the contractor was forced to achieve maximum labor productivity. However, this improved productivity was reported to have been accomplished totally independently of the LPC program. The quality of food service in Hospital D was reported to be as good as, if not better than, that in comparable institutions.

The *Business Office* had registered an 86 per cent performance index in the base year, had improved

to 92 per cent, had subsequently declined to 63 per cent in the second incentive year, and then had ended the experiment with a 70 per cent performance index. No explanation was provided for the improvement of six percentage points at the end of the first incentive year. A review of the data indicates that hours worked increased, and, thus, the improvement could be attributed only to an increase in demand for service — an increase of approximately 3,000 discharges over the base year.

The CEO explained the approximately 30 per cent decline in performance index from 92 per cent in the first incentive year to 63 per cent in the second incentive year. He pointed out that a very poor billing and collection service and a poor accounts receivable situation were among the many problems facing him when he assumed his position. He had given the person responsible for the function carte blanche to hire as many persons as necessary to improve billings and collections and to reduce accounts receivable. The CEO stated that this had been accomplished and, in the third incentive year, attention had been given to improving the labor productivity in this department.

The CEO also discussed the performance of the *Pharmacy and Radiology Departments*. The pharmacy had begun with a base-year performance index of 48 per cent, had improved to 54 per cent, and then had recorded performance indices of 64 per cent in the second and third incentive years of the experiment. Personnel interviewed were unable to explain the varying performance of the Pharmacy Department.

The Radiology Department had begun with a performance index of 79 per cent, had improved to 86 per cent in the first incentive year, had declined to 85 per cent in the second incentive year, and then had declined to 78 per cent in the third incentive year. The chief radiologist said he believed that levels of efficiency and effectiveness had been appropriate in the Radiology Department, as had been the operating costs. The radiologist also said that industrial engineering techniques had little application in radiology departments because only an individual trained in the technical aspects of such departments could contribute to improved efficiency. No explanation was given for the performance of the department during the experiment. The CEO stated, however, that he had known "intuitively" that both the Radiology and the Pharmacy Departments were operating at a satisfactory level of efficiency. He stated further that these departments had been

appropriately staffed, regardless of their performance indices.

Summary

Because of an almost complete change in managerial personnel at Hospital D, beginning with the second incentive year, and because two CASH representatives had been assigned to the hospital, it is somewhat difficult to evaluate the hospital's involvement in the experiment. As stated previously, accomplishments during the first incentive year of the experiment cannot be attributed to effective use of the LPC program or to motivation provided by the financial incentive offered. Rather, the accomplishments were seen as resulting from an increase in demand — an approximate increase of 3,000 patient days between the base year and the first incentive year — and from the imposition of rather strict controls on expenditures, which resulted from the serious financial condition of the hospital during this period.

The financial difficulties of the hospital were still apparent at the beginning of the second incentive year of the experiment, and these difficulties had both direct and indirect implications for the hospital's performance during the experiment. Because of the difficulties, the governing body had recruited and hired a CEO who was very financially oriented. Moreover, the CEO was supported by both the governing body and the medical staff in taking all reasonable actions to improve the fiscal stability of the institution. Related to the hiring of the CEO had been the selection of a new management team, which was also financially oriented.

Institution of the federal government's economic stabilization program in August 1971 may have also been a factor influencing the performance of this hospital during the experiment. The CEO stated that, "if anything, this discouraged our promoting greater productivity. . . . We were motivated not to reduce personnel as long as we were in the excess profit area."

Finally, accomplishments in the third incentive year were, in part, attributed to the hospital's increase in patient days without a concomitant increase in staff.

There was unanimity among the individuals interviewed regarding the motivational effect of the experiment's financial incentive. The financial incentive was not seen as a motivator at any time during the experiment. The CEO did comment, however, that had he been involved at the onset or

if the experiment were to be repeated, some attempt would be made to distribute awards to employees. The incentive payments resulting from the experiment had been placed in general revenues.

Conclusions

Hospital D earned an incentive reward in each of the three years of the incentive reimbursement experiment. Among all participating hospitals, it earned the largest single annual payment and accumulated the most incentive payments. The preceding discussion provides the basis for concluding that:

1. The financial incentive of CASH-IRE provided no increase in motivation to improve either departmental or overall hospital labor productivity during the experiment.
2. During the first incentive year of the experiment, the LPC program was not effectively utilized. Despite strong administrative support, the LPC program met with considerable confusion and lack of understanding at the department head level. In general, there was no indication that the program had contributed to the hospital's improved labor productivity.
3. In the third incentive year and, possibly, in the second, the LPC program was used as a management tool, primarily at the assistant administrator level. The LPC program was used, in part, to establish productivity targets for department heads and to monitor extent of the accomplishment of these objectives. It was also used otherwise to assist the assistant administrators in achieving targets they had negotiated with the CEO for their areas of responsibility.
4. The improved labor productivity in Hospital D occurred, primarily, as a result of actions taken to move the hospital from an unsound financial position to a sound one.
5. Labor productivity improvements were accomplished without sacrificing the quality of patient care.

The nature of this experiment is such that it is difficult to draw unequivocal conclusions regarding the participation of an individual hospital. Hospital D presents a particularly difficult problem because of the change in management and because of the

polar opinions of the two CASH representatives assigned to it during the course of the experiment. There is little question that a concerted effort had been made to improve the financial condition of the hospital and that increased labor productivity had been one approach used. The extraordinary improvement in labor productivity is best evidenced by the fact that, at the end of the experiment, the hospital was being operated with approximately 100 fewer full-time equivalent employees than it was during the base year. To some limited extent, the LPC program and data, along with the consulting services of the CASH representative, did contribute to the hospital's accomplishments.

Hospital F

Hospital F, which is a church-operated, short-term general hospital in a large urban area, is also a major teaching hospital for the church-operated medical school. This 452-bed hospital maintains a full range of services, including psychiatric and rehabilitation services. Hospital F was already a member of the Commission for Administrative Services in Hospitals (CASH) when asked to participate in the Incentive Reimbursement Experiment (IRE).

Hospital F began the experiment with a base-year performance index of 81 per cent. In each of the three succeeding years of the experiment, the PI declined; at the end of the third year, it was 78 per cent. The related gross total losses for this institution were \$148,545 for the first incentive year, \$37,285 for the second, and \$5,801 for the third. The respective figures for experimental net total losses for these three years were \$98,040, \$24,846 and \$3,856. In the first and second incentive years of the experiment, the hospital staffing pattern remained very stable, while patient days declined — the probable explanation for this hospital's decline in productivity. In the third year of the experiment, the hospital expanded its bed complement, and, while the census did rise, there was also a greater increase in actual hours relative to standard hours. The hospital's inability to staff in accord with variation in demand is the probable explanation for the third-year decline in labor productivity.

Previous CASH Affiliation

The CEO of Hospital F had been among the original promoters of the Commission for Administrative Services in Hospitals; Hospital F was one of the original CASH subscribers. Thus, both the

administrative staff and some department heads had knowledge of the CASH organization and its industrial engineering approach to improving hospital productivity. Comments by the CEO and by the CASH representative, who had been with the hospital for at least two years prior to the onset of the experiment, indicated that Hospital F had been a limited participant in pre-experiment CASH programs. The representative had conducted detailed studies in the Housekeeping and Dietary Departments prior to CASH-IRE, but little, if any, action had been taken to improve labor productivity.

At the time of his interview, the CEO had been at Hospital F for 13 years. He perceived operating costs and levels of efficiency and effectiveness in the hospital industry as less than adequate; however, he perceived them as adequate in Hospital F. Corroboration of this perception was offered in the form of comparative reports, which placed Hospital F in more favorable quartiles when compared with other hospitals — particularly hospitals of comparable size and scope of services.

The CEO described himself as a staunch supporter of the CASH organization and a believer in the concepts on which its programs were based. However, he criticized CASH standards and the first CASH representative assigned to the hospital. He said he thought that standards had been developed irrespective of variation in hospital layout, in levels of patient care, in methods of task allocation, and in the philosophy of patient care. The CEO commented, "I'm sure that CASH has both good and bad representatives. . . . We had one very poor individual, and, subsequently, we had a good one." He explained that discontent with standards in several departments had been reported to the first CASH representative and that little satisfaction had been gained until the so-called "good" representative was assigned to the hospital.

Involvement With CASH-IRE

The CEO described himself as highly motivated by the financial incentive; however, he was unable to describe definitive programs or actions initiated by himself, or by any of his immediate subordinates, that had been aimed at improving labor productivity.

(While both of the CASH representatives perceived the CEO as not taking leadership in encouraging improved labor productivity in Hospital F, they gave different explanations. The first representative described the CEO as a paternalistic leader who perceived his employees as family members. He

was an individual capable of making good decisions but one who reneged when department heads "cried on his shoulder." The second representative indicated that he believed that the CEO did not know how to respond to the information provided by the LPC program reports. The CEO was described by both as a very nice person who gave his department heads a great deal of autonomy and never demanded that action be taken to improve labor productivity.)

Two assistant hospital administrators were interviewed. They shared the opinion of the CEO that operating costs and levels of efficiency and effectiveness were better in Hospital F than in the industry. They also corroborated their perceptions with references to comparative ranking reports. Each stated, however, that the hospital could improve even more. Further, each said he believed that the application of industrial engineering techniques could be effective.

According to the assistant administrator for finance, the LPC program was not used effectively primarily because the original standards were believed to be less than adequate and no provision had been made for adjusting them. (It should be noted here that there were provisions for standards changes and changes were, ordinarily, to be initiated by the hospital.) This assistant administrator perceived the financial incentive as having little or no motivating effect. He said, "Good patient care is the prime motivator in this institution."

The other assistant administrator interviewed was the hospital coordinator for the experiment. He had been named to his position as assistant administrator at about the time the experiment began and had had no previous hospital experience. (It is interesting to note that both the CEO and the CASH representative identified this individual as the one having day-to-day responsibility for the CASH program but that he believed the responsibility was shared with him by the CEO and the assistant administrator for finance.) The administrator responsible for the experiment stated that he had a good relationship with the first CASH representative but that the representative had little or no rapport with department heads. In fact, he reported, many of the department heads both resented and disliked the CASH representative. The assistant administrator said that the representative would attempt to assess departmental problems and make recommendations but that department heads would express their resentment and no action would be taken.

This first representative recalled that most of his attention was focused on the Nursing Department. In several instances, he reported, plans and decisions were made to take action to improve productivity in this department. However, support had not been received from the CEO. He suggested that some of the responsibility for the lack of action at this institution may have been his own. "I didn't push hard," he said, "but only because I felt it would only stir up the pot and no action would be taken." The representative stated that most of his contact with the assistant administrator responsible for the experiment revolved around responding to requests to upgrade standards.

Review of Performance

Interviews with department heads, two CASH representatives, and the previously identified members of the administrative staff provided insight into, and understanding of, the level of awareness, understanding, and use of the LPC program at the department head level. Generally, levels of awareness and understanding among department heads were quite low. In seeking an explanation for the performance of selected departments, the interviewer found that the LPC program had not been effectively utilized and that most of the attention paid to it took the form of criticism of the standards. (In several cases, such criticism was based on erroneous assumptions of how standards were derived and how they might be utilized.) The hospital staff members interviewed seemed singularly unable to explain the performance of the selected departments in terms of labor productivity. Generally, department heads seemed to rely rather heavily on the budget as a guide to whether they were, in a managerial sense, operating efficiently and effectively. Reference to the LPC program was made in only those cases in which a low performance index was apparent; these references were, generally, limited to the inapplicability of the LPC program to this department or to the invalidity of the standards.

The *Nursing Department* began the experiment with a base-year performance index of 79 per cent, which declined in subsequent years, ending with a 73 per cent performance index. Neither the director of nursing service nor the nursing supervisor interviewed was able to explain the declining performance index. The director suggested that, given constraints existing at the time, the department was operating at an optimal level of productivity. She identified these constraints as: (1) the inadequacy of the transportation and communication systems in the hospital, (2) the department's

need to operate a messenger service, and (3) the need for a specialized high-dependency patient unit. It was reported that neither the CASH program nor its reports or data were used on an ongoing basis. CASH data were used only when it was necessary to make payroll and staffing projections for budget purposes.

Members of the administrative staff offered various explanations for the Nursing Department's declining level of labor productivity. The CEO stated that it was, in part, owing to the inadequacy of the CASH standards. He added that declining occupancy and the addition of a critical care unit had been partly responsible. The assistant administrator responsible for CASH-IRE referred to the opening of the critical care unit as a possible explanation. (It should be noted here that adjustments in standards were made to account for the opening of this unit.) The assistant administrator for finance and one of the CASH representatives said that the mere suggestion of staff reductions met with resistance from nursing personnel, as well as from members of the medical staff. The administration of the hospital was apparently unwilling to confront this resistance.

The *Radiology Department* had a 59 per cent performance index in the base year of the experiment. In the three succeeding years, the index was 58 per cent, 73 per cent, and 68 per cent. The chief technologist and the chief administrative technologist were interviewed. The latter was a particularly vocal critic of the CASH programs and made frequent and, at times, erroneous criticisms of the CASH standards. His criticisms were that: the standard did not account for the fact that patients in Hospital F were more difficult and procedures were generally more complex, with more views provided. He produced a Statistical Data Record form used by CASH to collect base-line data to illustrate his criticism. This individual was embarrassed to find that the form provided for identifying specific procedures and maximum-difficulty patients, as well as for the number of patients and the number of exposures. The only valid criticism of the program offered was that, on an ongoing basis, the LPC program did not take into account the mix of patients and procedures. Other than speculating that there had been a change in the mix of patients and procedures, the technologists could offer no explanation for the low and variable performance of this department.

(It should be noted that the technologists had been called upon to provide an explanation for the department's less than adequate performance.

However, these requests had been initiated on the basis of budget variance rather than on LPC figures. The LPC program was not used on any ongoing basis in this department.)

The CEO was unable to provide an explanation for the Radiology Department's performance during the three-year life of the experiment. He said, "We are interested in quality and do what is needed to provide quality service." The assistant administrators agreed that resolution of problems following the opening of a new special procedures room in mid-1971 may, in part, have explained the improved labor productivity in the second incentive year. The assistant administrator responsible for CASH-IRE suggested that there had been some problem with the professional competence of the head radiologist and that the administration had been reluctant to take action to improve productivity until this problem was resolved. The CASH representatives had little contact with the Radiology Department.

The director of the *Medical Record Department*, who was interviewed, had been hired about the time the second incentive year began. Her predecessor had been terminated because she was an ineffective manager.

The new director of medical records did not appear to be managerially oriented either. In response to questions regarding her perceptions of operating costs, level of efficiency, and the applicability of industrial engineering techniques and their potential impact in the Medical Record Department, she said that, since she had assumed responsibility for the department, "the efficiency, morale, and everything had improved." She seemed to have little understanding of the LPC program and commented, "I don't see any improvements in their [CASH's] stupid graphs." Initially, the consistently low performance index of the department was reported to be very discouraging. An explanation for the low performance index was sought, at one time, by the administration. When told by the department head that the department was operating efficiently, the administration did not criticize the low performance index again.

The explanation provided for the department's consistently low and declining performance index — 57 per cent in the base year and 52 per cent in the third incentive year — was that more, not fewer, people were needed to operate the department. It was reported that the department had assumed additional medical-staff-related responsibilities since the onset of the experiment. These

additional responsibilities were not, apparently, reported to the CASH representative nor was a request made for standards revision. The LPC program was not used in this department; the department head relied instead on budget guidelines to determine whether resource allocations were acceptable. The CEO's comment on the performance of the Medical Record Department was that the "quality is high. The low performance index is probably indicative of the inaccuracy of the standards." The assistant administrator in charge of CASH-IRE said he thought that some improvements had been made with the hiring of the new department head but that these improvements may have been obscured by expanded services. He mentioned, in particular, some medical-staff-related activities and the new transcription service that had been added.

The director of the *Admitting Department* was a particularly vocal critic of the CASH program. She seemed somewhat familiar with the LPC program but was unaware that the experiment had a financial incentive. She did not perceive standards as adequately accounting for the unique services offered by this department. Furthermore, she reported that, in the last week of the 28-day base period, data collection was inaccurate because of an excessive workload and staff fatigue. The department's low performance index was discussed by the director and her immediate superior several times during the experiment. They mutually concluded that there was a necessity for the department to be reevaluated. (The request for reevaluation was not initiated, however, until after the experiment had been completed.) The LPC program clearly had not been used by this department.

The director of the *Admitting Department* was unable to explain the hospital's performance indices throughout the experiment: 51 per cent in the base year, 50 per cent in the first and second incentive years, and 52 per cent in the third incentive year. The CEO commented that this department did more than others and that the standards must have been off. The assistant administrator for finance, who had line responsibility for this department, offered an explanation similar to that of the CEO. He added that "the CASH representative did not like our admitting service. . . . He tried to run it, rather than give management tools." The assistant administrator responsible for CASH-IRE could offer no explanation for this hospital's low performance.

Both CASH representatives made similar comments about department heads at Hospital F. One stated,

"I never met a department head who was anything but pleasant. . . . They are good people who mean well." It was reported that only members of the religion with which the hospital was affiliated could serve as department heads. In one CASH representative's opinion, the faith could not supply enough talent to run all of its hospitals; hence, there were a number of incompetent department heads at Hospital F. The representative pointed out that there were a number of competent ones, but even these department heads "did nothing with the data, except to request that standards changes be made so they would look better." The other CASH representative indicated that "these people [department heads] just didn't know how to react."

Explanations for the hospital's overall performance in the experiment were offered by the CEO and members of the administrative staff. There was complete agreement that the 78-bed expansion and the hospital's decline in occupancy contributed to its decline in labor productivity. Two of the administrative staff members referred to the February 9, 1971 earthquake, believing it to have been a contributor to the hospital's decline in productivity. Another explanation offered by the CEO was the hospital's initial high performance index. (It should be remembered that the CEO recalled that the initial performance index was 90 per cent, rather than the 81 per cent calculated by CASH.)

Overall Performance

The CASH representatives offered their opinions on the hospital's overall performance. The representatives agreed that the hospital maintained a sound financial operation. They had not been motivated by the financial incentive to take any actions other than those that they had traditionally taken to accomplish the objectives of the institution. The institution was perceived as very traditional and concerned, wherever possible, with meeting the requests of the hospital and medical staffs for equipment, services, and personnel. Moreover, there was a general reluctance on the part of the hospital administration to confront department heads or to raise possible conflicts with members of the organized medical staff, even when the administration believed that requests were not entirely consistent with maintaining cost-effective operations.

It was most apparent in interviewing members of the administration, department heads, and the CASH representatives that Hospital F relied very heavily on its budget systems and procedures to control resource allocations. One CASH representa-

tive indicated that he had worked with the hospital administration to develop a budget based on standards but that the hospital used its own standards, rather than those of CASH. This representative perceived the use of the hospital's own standards as a tool in maintaining the status quo. It was clear that department heads did not use the LPC program on an ongoing basis; instead they concerned themselves with remaining within budget guidelines.

Conclusions

The preceding discussion, based on intensive interviews with hospital personnel and with CASH representatives and on a review of the experimental data, provided the rationale for the following conclusions related to Hospital F's participation in the Incentive Reimbursement Experiment.

1. The financial incentive of the CASH-IRE prompted no increase in motivation, for either the CEO or members of the hospital staff, to improve individual departmental or overall hospital productivity indices during the experiment.
2. For the most part, the LPC program and its data were not used by Hospital F. On occasion, however, the data may have been used by the hospital administration as leverage for refusing department head requests for additional personnel. The data may also have had some use in developing the hospital's budgeting system.
3. Improved labor productivity was, at best, a minor priority of the hospital administration. As long as the hospital remained reasonably sound financially, there was no concerted attempt to improve its labor productivity on a departmental basis, even in those several departments that displayed performance indices of 60 per cent or less.

Hospital F was one of several experimental hospitals in which the PI declined and an incentive loss was computed in each of the three years of the experiment. This is a hospital with a long and strong tradition of serving its community by providing high quality care and also of being a "workshop" for its attending medical staff. In this respect, Hospital F appears to be typical of most large, voluntary hospitals. It is unique, however, in that it was seemingly able to continue in this tradition because of its sound financial position. Unlike many of its counterparts, which have been

forced to become more cost conscious because of financial constraints, Hospital F continues to meet the requests of physician and hospital staff members, avoiding, if possible, organizational conflict.

Hospital M

Hospital M is a nonprofit, community hospital, located in a large urban area.⁵ At the time of its participation in the Incentive Reimbursement Experiment (IRE), conducted by the Commission for Administrative Services in Hospitals (CASH), the hospital had 96 beds and was providing a full range of services. Hospital M earned an incentive award in each of the three incentive years of the experiment, for a total of \$30,547.

The following summary and conclusions are based on data drawn from experiment reports and the indepth interviews conducted.

Hospital M received incentive payments totalling \$30,547 during the three years of the experiment. The hospital's performance index improved from 74 per cent in the base year to 82 per cent in the third incentive year. During this period, patient days declined from 26,719 in the base year to 24,348 in the third incentive year. Only in the first incentive year did patient days increase. Despite the decline in patient days, Hospital M was able to increase its overall performance index and earn incentive payments.

Interviews conducted with the hospital's chief executive officer, selected department heads, and the CASH representative assigned to the hospital showed that the hospital's performance resulted from the cost-containment policies and efforts of the CEO. These efforts were not perceived as having been enhanced by the CASH-IRE financial incentive. The LPC program had been used as additional leverage in budgeting negotiations, which had been the principal means used by the CEO in controlling hospital staffing.

Involvement With CASH-IRE

Hospital M's CEO expressed his favorable attitude toward the experiment but offered contradictory comments concerning it. He perceived hospital operating costs as appropriate, although he judged some departments to be in need of improvement.

⁵ In the sample of Southern California hospitals originally selected for participation in this experiment Hospital M was identified as a proprietary hospital. This identification was in error. Hospital M is a nonprofit institution, operated by a religious order.

Moreover, he said he considered industrial engineering methods to be an important adjunct in helping lower hospital costs. Upon closer questioning, however, this individual demonstrated that he did not understand the bases upon which the LPC standards were developed — he thought them to be identical for all participating hospitals — nor did he continue to subscribe to CASH, or to any other industrial engineering system, following the conclusion of the experiment. The CEO admitted that the financial incentive had not provided much motivation for improvement.

It should be noted that at least one department had been involved in an incentive plan at one time in Hospital M. This plan had been a bonus system that had involved sharing with the department head cost savings that resulted when projected budget costs exceeded actual costs. It was not based on industrial engineering methods.

During the experiment, the CEO had informed department heads that labor productivity improvement “was something we had to do.” Because the program had been sponsored by an outside agency, the CEO thought he could use the data more forcefully because employees would blame CASH, not him, for any problems. The CEO indicated that he had used the LPC program to improve productivity in departments exhibiting what he considered to be poor performance. He could not say how or what he had done in attempting to improve productivity, even though he had implied that changes in department leadership were the ultimate actions usually taken.

Review of Performance

When asked about department performances, department head attitudes, and CASH involvement at Hospital M, the CEO indicated that most key personnel had only a low level of understanding of CASH-IRE.

The CEO described the *Nursing Department* as the major beneficiary of CASH services — hence the consistent improvement in this department’s performance index. In response to probing for specifics, the CEO could offer only one — CASH-recommended changes in nursing schedules. When the revised schedules were implemented, the once negative attitude of the director of nursing toward CASH changed markedly. This department head had become a strong supporter of CASH programs. However, no one described any ongoing use of the LPC program or data in this department.

While the performance index of the *Business Office*

climbed from 86 per cent in the base year to 95 per cent by the end of the experiment, the CEO rated this department’s effectiveness as one of the lowest. Turnover of supervisory personnel and a resulting inability to maintain timely and effective operations were cited as reasons for poor performance. According to the CEO, the relatively high performance indices did not reflect that department functions were poorly planned and delegated. The Business Office manager described her attitude toward CASH as having become more positive as a result of her review of monthly LPC reports, through which she was able to compare performance over time.

The *Inhalation Therapy Department* was described by the CEO as poorly managed. However, he reported that he had taken no action to suggest or to make any improvement. This department, nevertheless, exhibited a dramatic increase in performance index from 75 per cent in the base year to 101 per cent in the third incentive year. An interview with the CASH representative revealed that he had not contributed toward improvement in this department. The department chief’s negative attitudes toward CASH, his minimal understanding of the labor performance standards, and his lack of knowledge of the improvement in the department’s performance index were attributed to his lack of involvement with the LPC program, the CASH representative, and the CEO.

The performance index of the *Medical Record Department* declined from a high of 99 per cent to 79 per cent at the end of the experiment. For this decline the CEO blamed poor management effectiveness in the department, poor receptivity to CASH, and a change in department heads. Both the CEO and the department head identified equipment inadequacies and a manual data retrieval system as factors contributing to the decline in performance index. The CEO’s statement conflicted with an earlier statement by him that no equipment changes or problems had had any effect on the hospital’s performance. (Once again, he had showed a lack of understanding of the basis on which standards had been developed.) The CASH representative had been unaware of a performance decline in this department. He stated that he was unaware of any factors, other than labor input, that might have influenced Hospital M’s performance. The representative indicated that he had used Hospital M’s Medical Record Department as a model in discussions with other hospitals.

The *Radiology Department* was characterized by the CEO as being poorly managed. He said he

believed the decline in performance index — from a high of 87 per cent in the first incentive year to 66 per cent at the end of the experiment — was the result both of professional pressures for increased staff and of a decline in volume. During the second incentive year, one additional FTE was added to this department; the annual volume of radiology examinations remained almost constant. During the third incentive year volume had declined by 10 per cent, and actual hours had remained at the previous year's level. No effort had been made, however, to introduce the LPC staffing methodology to departments headed by physicians. The CEO had not wanted to involve any physicians in CASH-IRE, since such involvement might jeopardize professional relations. The CASH representative substantiated the CEO's attitude. The CEO had told the CASH representative to keep "hands off" the professional departments.

Conclusions

Hospital M was among seven of the 25 experimental hospitals that experienced an overall cumulative incentive gain throughout the experiment. Its \$30,547 total incentive payment was reflective of a relatively small, but consistent, increase in labor productivity. Results of this case study lead to the conclusion that:

1. The financial incentive provided little motivation for the CEO, and none for the remainder of the staff, to improve labor productivity.
2. LPC data may have been used as leverage and as an adjunct to the budgeting process in controlling resources, including labor.
3. The CEO's dissatisfaction with department effectiveness, in several cases, suggests that increased efficiency may have been achieved at the expense of effectiveness.
4. With the possible exception of scheduling changes in the Nursing Department, no direct relationship between improved labor productivity in Hospital M and its use of the LPC program was apparent.

Hospital S

Hospital S is a 447-bed county hospital, located in the southern part of California. It is a university-affiliated teaching hospital that provides a full range of acute and chronic care services for both inpatients and outpatients.

The following summary and conclusions are based on an indepth review of LPC data for Hospital S and on the interviews held with hospital personnel and the CASH representative.

Summary

The performance index for Hospital S declined in each of the three years of CASH-IRE — from a high of 102 per cent in the base year to 100 per cent, 93 per cent, and 89 per cent. This decline resulted in a cumulative net total loss of \$316,650 for the experiment. Although patient days at Hospital S declined by about 10,000 between the base year and the third incentive year, inpatient standard hours increased from 1,139,109 to 1,159,855. The decline in patient days and the increase in standard hours reflected a higher admission rate and shorter average length of stay. This situation resulted from a concerted effort by county and hospital officials to change the mix of patients to reflect the hospital's trend toward providing more acute care and more outpatient services.

Influencing Factors

Two key factors had overriding significance in relation to the hospital's performance during the experiment. The first was the effort by the hospital to change its image to that of a community hospital. This effort was reflected in the aforementioned change in patient mix and in increased budgets as well. The second factor was the general misunderstanding of the LPC program and its data. This misunderstanding became apparent as the interviewer attempted to elicit a clear understanding of what had happened to cause the significant decline in performance. Internal philosophical conflicts among key staff personnel, turnover of CASH representatives, and the relatively high performance index during the base year were all offered as explanations, by key personnel and by the CASH representative, for the decline in the hospital's performance index. Comments made by the CEO and by the CASH representative suggested that the declining performance had been expected by these individuals.

The chief executive officer of Hospital S showed a mildly positive attitude toward CASH-IRE. His belief about the benefit of industrial engineering techniques was also mildly positive. However, he seemed more concerned with the "human" elements of administration than with effectiveness and efficiency levels. The CEO stated that he had attempted to strike a balance between the rigid implementation of LPC standards, endorsed by the assistant administrator, and the traditional

methods, espoused particularly by the director of nursing — i.e., to staff at levels judged necessary to provide a high quality of patient care. The CEO reported that the financial incentive had provided no motivation to improve productivity at Hospital S. He described the assistant administrator as interested in scientific management techniques but not motivated by the potential of earning a financial reward. (It should be noted that, in his interview, the assistant administrator stated he was the only one in the hospital motivated by the incentive.)

Review of Performance

Subsequent interviews with the director of nursing, the assistant administrator, and the CASH representative reinforced the interviewer's impression of the management roles assumed by these persons — roles described by the CEO. The interviews also tended to confirm the interviewer's finding that key management officials at the hospital had been unfamiliar with LPC methodology.

The *Business Office* at Hospital S demonstrated a relatively high performance index of 102 per cent in the base year, followed by indices of 101 per cent, 110 per cent, and 74 per cent. Administration pressure to reduce accounts receivable "at all costs" and revised reporting requirements for Medicare and Medi-Cal patients were described by the CEO, the assistant administrator, and the department representative as contributing to the decline of this department's performance index. The LPC program was considered unimportant in this department, especially during the last incentive year. According to the senior accountant, no feedback concerning performance was received.

In the *Nursing Service*, the director of nursing reported that participation in the LPC program had resulted in her humiliation and in undue interference in the operation of the department by the assistant administrator. The CEO reported that the overall decline in performance in nursing, from a high of 104 per cent to a final 89 per cent, had been a result of increased staffing, in response to a change in patient mix. Increased staffing levels were thought, by the CEO, to be generally appropriate. According to the CASH representative, the need for standards adjustments for most of the claimed changes in nursing activity was reviewed and accounted for in performance index calculations, where deemed appropriate. However, adjustments were not made to the complete satisfaction of the director of nursing. The ability of the director of nursing to convince the CEO that

CASH had failed to change nursing standards to levels considered appropriate by her and the assumption by CASH that medical/surgical patient acuity levels had not changed are seen to have been the major reasons for the decline in performance in this department.

The decline in the *Pharmacy Department's* performance index — from 88 per cent in the base year to 86 per cent, 82 per cent, and 65 per cent — was described as resulting from LPC standards that had not reflected actual workloads. It was the belief of the chief executive officer and of the chief pharmacist that control-period data no longer reflected the mix of outpatient and inpatient activity and that this change in activity had affected the performance index. The representative admitted a lack of follow-up by CASH in this department because of the turnover in representatives during the experiment. The chief pharmacist had not regularly received LPC reports for his department, and much of what he knew about its performance had been reported to him by the assistant administrator. It was also discovered that significant errors had occurred in the reporting of the volume of outpatient prescriptions, which may have affected incentive calculations.

Overall Performance

Hospital S was one among 18 hospitals in the experiment that experienced a cumulative incentive loss during CASH-IRE. Its loss of \$316,650 is reflective of a progressively declining performance index. Nevertheless, for the base year and for the first and second incentive years, Hospital S demonstrated the highest average performance index of all experimental hospitals. It had the second highest performance index for the third incentive year.

Conclusions

The preceding discussion of Hospital S provides the basis for concluding that:

1. The financial incentive offered by CASH-IRE provided no motivation for either the CEO or key staff to improve hospital performance indices during the life of the experiment.
2. Many internal and external (to the hospital) factors kept the hospital from either maintaining or improving pre-experiment productivity levels.
3. CASH representatives either did not adequately orient hospital personnel to reporting

changes that might have influenced departmental performance or did not personally monitor activities to the extent necessary to detect these changes. Hence, the overall performance index of Hospital S may not truly reflect performance during the experiment.

4. The LPC program and its data were not understood or used to improve labor productivity by the hospital's CEO. Although the assistant administrator had utilized LPC information, his understanding of the program, and hence his use of it, was not in accord with the procedures outlined by CASH.
5. The LPC program and its data were neither understood nor used at the department head level — except possibly in the Nursing Service. There was little use of LPC data in Hospital S.

The overriding effects of attempts to alter the image of Hospital S, from a traditional public to a community-oriented institution, may be interpreted as a major factor causing the decline in performance index in this hospital. Other contributing factors included the possibility that LPC standards failed to reflect changes in patient mix, the changes in CASH representatives, and a staff traditionally oriented to budget-related staffing systems and unfamiliar with the LPC program. The image change and possibly the other factors identified in this case study may be indicative of factors that produced similar outcomes in other participating county hospitals.

Hospital V

Hospital V is a nonprofit, acute-care hospital, located in a coastal community south of a large urban area. At the onset of the Incentive Reimbursement Experiment (IRE), the hospital was licensed to operate 140 beds. Subsequently, it engaged in a construction program, and it had applied for a license to operate 207 beds by the time the experiment was completed.

Understanding the chief executive officer and his management style was a key to describing and assessing the involvement of this hospital in CASH-IRE. The CEO was both observed as and reported to be a "political manager," interested in maintaining an efficient and effective hospital operation. However, he was willing to confront only those parts of the operation that he was reasonably certain would not "rock the boat."

Involvement With CASH-IRE

The CEO had an initial lukewarm reaction to CASH-IRE. He was reported to have become more positive toward the experiment and the LPC program toward the end of the experiment. Operating costs and levels of efficiency and effectiveness were perceived by the CEO as being more favorable in his hospital than in the overall hospital industry. He described them as adequate or more than adequate in Hospital V. He saw industrial engineering techniques in general, and those of the CASH organization in particular, as potentially quite valuable in improving the operation of most other hospitals and of some value in Hospital V.

Data generated from the LPC program were perceived by the CEO as a tool. He relied almost exclusively on his own perceptions and instincts to identify problem areas within his organization. If the performance index of an organizational component proved to reinforce his own conclusions, he might have used it to build a case for accomplishing the desired result. LPC program data might also have been used as a lever to prod department heads into taking actions desired by the CEO. More typically, the CEO would achieve results by refusing requests for additional personnel or by refusing to approve requests for personnel replacements. With respect to these actions, it was not unusual for the CEO to order the personnel director not to take action on requisitions — issuing such orders without even conferring with the department heads involved.

Orientation to the experiment for department heads and the organized medical staff was conducted by the CEO. Staff members were not apprised of the fact that this was a voluntary program through which a financial incentive might be earned. Rather, they were told that it was a government program and that the hospital was required by the government to improve its productivity.

The assistant administrator responsible for personnel was assigned as the hospital's liaison with CASH. This individual stated that the theme established at the orientation was carried through the experiment. The LPC program was continuously presented as a requirement of the federal government, which was demanding productivity improvements. The assistant administrator stated, "We forced them [department heads] to use it [the LPC program]." During the interview with the assistant administrator, this individual at-

tempted to characterize himself as an active and effective user of the LPC program. However, his inability to identify specific activities undertaken to improve productivity, together with comments made by the CASH representative, strongly suggested that no such active and effective use was made. This assistant administrator continually emphasized that a program had been begun, prior to the onset of the experiment, for improving the level of management expertise and labor productivity. The LPC program had merely been a tool to help accomplish these ends.

Interviews conducted at the hospital and with the CASH representative generally characterized department heads as having a poor understanding and a low level of awareness of the LPC program. The CASH representative stated that, by the end of the experiment, heads of the Dietary, Housekeeping, and Maintenance Departments did have a good understanding of the program. In fact, these department heads had used it. The professional department heads had little understanding of the program and, apparently, were not pushed by the hospital administration to use the program to improve productivity.

Review of Performance

An indepth review of the performance of four departments indicated the manner in which the LPC program was used throughout the hospital. At the onset of the experiment, the Admitting Department was described as a weakly managed problem area. It was reported that the CEO had been aware of this for some time. Moreover, the reduction of approximately 12 full-time equivalent employees, which resulted in an increase in PI from 38 per cent to 79 per cent in the first incentive year, had been accomplished by administrative fiat. It was generally believed that these reductions would have been made with or without the presence of the LPC data.

A satisfactory explanation could not be obtained for the Admitting Department's subsequent decline in performance index to 70 per cent in the second incentive year and 47 per cent in the third incentive year. It was suggested that the creation of a separate outpatient admitting function in the new building may have contributed to this. However, it was not until the interviewer pointed out that there may have been a trade-off in functions between the Admitting and PBX Departments that the trade-off was also offered as a possible explanation. Neither the opening of an outpatient admissions function nor the transfer of functions was of sufficient magnitude to account for the change.

In the first year of the experiment, the CEO used the LPC data as justification to reject a request for additional personnel in the Radiology Department. The CEO was reported to have yielded ultimately to pressures from the radiologist and from supporting members of the medical staff, granting the staff additions. The performance index of this department dropped from 105 per cent in the base year to 65 per cent in the first incentive year. In subsequent years, the department's performance index deviated only one per cent from that first-year level.

The chief of radiology demonstrated a very poor understanding of the LPC program and completely discounted the program as having any potential value for improving departmental operations. He stated that "industrial engineers couldn't possibly know more than radiologists or chief technicians about the operation of a radiology department. . . . They could only make recommendations at the cost of quality." After the CEO's initial resistance to the department's request for additional personnel, there was no indication of subsequent attempts to encourage improved labor productivity. It was implied that the CEO was unwilling to confront this group.

The director of nursing at Hospital V was described by both the CASH representative and the CEO as extremely resistant to the LPC program during the first and second year of the experiment. She was alleged to have enlisted, and gained, the support of her staff and of some members of the medical staff in vigorously resisting the LPC program. The reactions and actions of the director of nursing ultimately led to her termination. The CEO was reported to have been primarily interested in reducing the ratio of licensed nursing personnel to unlicensed personnel. The director of nursing, however, strongly resisted reducing the percentage of registered nurses from 65 per cent to the CEO's desired level of 50 per cent.

Despite this resistance, the Nursing Department improved its performance index from 80 per cent in the base year to 82 per cent in the first incentive year. The assistant administrator who was the liaison with CASH suggested that the improvement had been accomplished as a result of the CEO's refusal to hire additional nursing personnel. While none of the other interviewees corroborated this observation, there was mention that the hospital had difficulty in recruiting personnel during this period and that this was a more likely explanation. There was, however, no explanation for the depart-

ment's decline in performance index to 79 per cent in the second incentive year.

The increase to 82 per cent in the third incentive year was explained as having resulted from the hiring of a more cooperative director of nursing — one that agreed to a reduction in the staffing level. It was also reported that the ratio of licensed to unlicensed nursing personnel was reduced to approximate more closely the 50 per cent level desired by the CEO. The CASH representative commented that this labor cost-saving technique was not accounted for in the experiment.

The Dietary Department was one of only three that took positive action aimed at improving labor productivity. Such action was alluded to by the CEO and discussed by the CASH representative. The CASH representative had more fully oriented the head of the Dietary Department to the LPC program; subsequently, staffing patterns were assessed in terms of service demands and adjustments were made. These activities were initiated toward the end of the first incentive year, and it was reported that the department head continued to attempt improvement throughout the experiment. The department's performance during the experiment — beginning with a base-year performance index of 69 per cent and a closing index of 79 per cent — reflected the accomplishments of this department.

Use of the LPC Program

Use of the LPC program at Hospital V was carried out on two levels. On a hospital-wide level, the program was used as "a manipulative tool." This characterization is used by the interviewer because of the manner in which department staff members were oriented to the program. The fact that they were told that the program had been imposed upon the hospital as a federal requirement and that they were required to improve the productivity leads to this characterization.

On the departmental level, the LPC program was used as intended in three departments. As already discussed, the Dietary Department was one of these. In addition, the Maintenance and Housekeeping Departments were reported to have used the same approach as the Dietary Department in improving labor productivity. The performance index of the Maintenance Department reflected this use, in that the base-year performance index was 67 per cent and the third incentive-year performance index was 99 per cent. The Housekeeping Department improved its performance in-

dex from 78 per cent in the base year to 84 per cent in the second incentive year. However, there was a decline to 72 per cent in the final year of the experiment. The figures for the Housekeeping Department are not easily interpreted. It was suggested, however, that perhaps the opening of the new facility was the reason for the Housekeeping Department's decline in performance index in the third incentive year of the experiment, even though the CASH representative thought that the LPC program had been useful in projecting staffing patterns for the new facility.

The Hospital V case study suggests that the LPC program was used to some limited extent. Moreover, it suggests that the program may have contributed to the hospital's improved labor productivity over the three-year life of the experiment. The CASH representative, in particular, implied that this was the case; he said he believed that the program had probably been most effective in assisting the hospital to project staffing requirements properly for the move into the new addition. The CASH representative said he believed also that the desire of the CEO to remain with this hospital until retirement, together with his style of management, would probably have caused him to act as he did during this three-year period with or without the experiment.

While there was some inconsistency among interviewees in describing the extent to which the LPC program was used, there was unanimous agreement that the financial incentive had not been a motivator. According to the interviewees, the hospital's improved productivity could not be attributed to motivation provided by the potential for earning a financial award.

Because the hospital was a consistent winner in each of the three years of the experiment, an attempt was made to assess subjectively whether there had been any deterioration in the quality of service at Hospital V. Again, there was a consensus — ranging from the opinion of the chief of staff to that of the CASH representative — that, if anything, the quality of service had improved at Hospital V during the experiment. It accumulated incentive payment awards of \$86,073 over the three-year period, despite both a reduction in the demand for service and an involvement in a construction program that expanded its bed capacity approximately 50 per cent. Assessment of the total incentive payments received by the hospital as a percentage of total gross incurred annual payroll showed this hospital to be among the most successful in the experiment.

Conclusions

The preceding discussion presents the rationale for drawing the following conclusions about Hospital V and its involvement in CASH-IRE:

1. The financial incentive of CASH-IRE prompted no increase in motivation for either the CEO or key staff members to improve overall hospital productivity or departmental productivity during the life of the experiment.
2. On a hospital-wide basis, the LPC program was abused, in that it was promoted as a program to which the hospital was required to subscribe — one in which it was mandatory for the hospital to adhere to standards and to improve productivity.
3. Essentially, the LPC program was used as intended in only three departments. Improved performance indices in these departments provided evidence that the proper use of the program contributed to improved labor productivity.
4. The LPC program may have been used most effectively in assisting the hospital administration and department heads to develop proper staffing levels for the expanded facility in the third incentive year of the experiment.
5. The accomplishments of Hospital V during the life of the experiment were very much more a function of the CEO's aspirations and management style than of effective use of the LPC program.

The nature and subject of this experiment were such that it was exceedingly difficult to draw unequivocal conclusions. In the case of Hospital V, this problem was compounded by the sometimes conflicting information received from interviewees. The general conclusion was reached, however, that many of Hospital V's accomplishments would have been achieved whether or not it had been involved in the experiment and whether or not it had used LPC data. This conclusion has been reached, in part, because the CEO, the assistant administrator, and the CASH representative were unable, at times, to:

- Demonstrate relationships between activities undertaken and results achieved, as measured by the performance index, or
- Explain the reasons for increases or declines

in the performance index of selected departments.

Hospital W

Hospital W is a 368-bed hospital which is located in a large urban area. Owned and operated by a religious order, this institution provides a full range of services to its community. As a participant in the Incentive Reimbursement Experiment (IRE) conducted by the Commission for Administrative Services in Hospitals (CASH), it received incentive rewards two of the three years of the experiment — the second and third years.

Hospital W was one of two hospitals selected for case study prior to completion of the experiment. As a result, two series of interviews were conducted. First, initial interviews with administrative staff members and department heads focused on the first incentive year of the experiment. Second, follow-up interviews were conducted with the assistant administrator for personnel and management analyst services (including CASH-IRE) and the CASH representative assigned to the hospital. These interviews focused on the second and third incentive years. This hospital, as measured by CASH-IRE indicators, remained remarkably stable in the first incentive year and improved during the second and third years.

At the close of the first incentive year of CASH-IRE, Hospital W was computed to be a \$10,538 net total loser. This hospital remained remarkably stable during that period:

- Patient days decreased by 545, from 118,704 in the base year to 118,159 in the first incentive year.
- Total standard hours increased 16,028, from 1,394,766 to 1,410,794.
- Actual total hours increased 24,287, from 1,639,166 to 1,663,453.
- Occupancy remained at 88 per cent.
- The performance index declined insignificantly.

A review of the performance of individual departments during the first incentive year showed that the stable performance occurred on a departmental basis as well as on an overall basis; it was not a result of improvement and decline trade-offs. This stability is underscored by the fact that the computed dollar losses were extremely minor with

respect to the hospital's overall payroll, which averaged in excess of \$6 million during the base and first incentive years.

Generally, the stability described here continued to prevail through the second and third incentive years. In the second, patient days and occupancy did decline to 115,362 and 85 per cent, respectively; however, by the third year, these figures returned to previous levels — 118,307 patient days and 87 per cent occupancy. The performance index improved in each year — from 85 per cent in the first year to 87 per cent in the second and 89 per cent in the third. Net incentive payments were \$72,349 for the second year and \$88,522 for the third incentive year.

Interviews conducted with Hospital W's administrative staff, with other key individuals, and with the CASH representative revealed both historical and operational reasons for the hospital's stability during the first incentive year, as well as for its productivity improvements and incentive payment earnings in the second and third years.

Previous CASH Affiliation

Hospital W was one of the first hospitals to subscribe to the services offered by the CASH organization. As early as 1963, this hospital had begun implementing the departmental labor utilization improvement programs developed by CASH. According to the CASH representative, the Nursing, Housekeeping, and Dietary Departments and the Business Office had implemented CASH programs prior to the initiation of the Labor Performance Control program. There was some contradiction in recollections of persons interviewed with respect to the extent to which these departments actively operationalized the CASH programs. The associate administrator of the hospital and one of the assistant administrators stated that the hospital was, historically, actively involved with CASH; however, with the exception of the Department of Nursing, they were unable to indicate the nature and depth of involvement. The assistant administrator responsible for CASH programs indicated that, in his view, nursing was the only area that had participated in the CASH program in other than a superficial manner. There was consensus, however, on the fact that the Department of Nursing, and most of its individual units, had operationalized the CASH programs with significant positive results. Despite the conflicting recollections, it was clear that, historically, this hospital was aware of and receptive to CASH, its techniques and programs.

Involvement With CASH-IRE

During various interviews, it was suggested that the hiring of a trained management analyst as the assistant administrator for personnel and management analyst services (including CASH-IRE) was expected to contribute to an improvement in the hospital's performance index. It was learned, however, that this assistant administrator had developed a long-range program for improving management efficiency and effectiveness and that efforts toward an improvement in the performance index were not scheduled to begin until the end of the second incentive year of the experiment.

As reported, the CEO in Hospital W had a strong desire to improve the hospital's performance index. This desire was reflected in her review of monthly LPC reports and in the meetings she had with the heads of low-performing departments.

During the first incentive year, only three or four departments in the hospital registered poor performance indices. It was these departments that the CEO particularly monitored; she called in the department heads for discussion of their low performance index. Admitting and Surgery were two of these departments. As noted by the CASH representative, however, the performance indices of these two departments did not deviate significantly from the median of the performance indices of all hospitals participating in the CASH LPC program.

Review of Performance

Interviews conducted with the heads of the four departments reviewed in depth — Laboratory, Dietary, Admitting, and Nursing — revealed a high level of awareness of CASH-IRE, a generally receptive attitude toward the experiment, and some substantial agreement on the potential utility of the program in improving efficiency and cost effectiveness in their own departments, as well as in departments throughout the hospital industry.

The *Laboratory* and *Dietary Departments* demonstrated performance indices of 100 and 105 per cent, respectively, in the base year, gradually improving to 127 and 114 per cent, respectively, by the end of the third incentive year. The hospital administrative staff and the CASH representative concurred in the belief that these departments were well managed, that their performance indices reflected this, and that no special effort was needed to improve their performance indices. Both department heads indicated that their high performance had been achieved independently of the

LPC program, saying that the performance index of the LPC program was an invalid measure of efficiency in their departments. The explanations offered, which were identical, related to the fact that the standards developed for the departments were computed on the basis of individual tasks performed during a 28-day period and that subsequent calculations of standard hours required were based on individual standard bases — i.e., tests for the Laboratory Department and census for the Dietary/Cafeteria Department. *The department heads accurately pointed out that the 28-day sampling failed to take account of seasonal variations in mix of departmental tasks and that standards must be constantly updated to account for the addition or deletion of tasks performed and/or in the change in mix of tasks if the performance index computed is to have validity.* In their final interviews, the CASH representative and the assistant administrator responsible for CASH-IRE made comments relative to the high PIs of these two departments. The representative stated that the equipment in the Dietary/Cafeteria Department might be more advanced than that provided for in the standards. The assistant administrator speculated that the PI in the laboratory might be misleading because standards had not been revised since the time the hospital had acquired a Coulter counter.

The *Admitting Department* demonstrated a performance index of 61 per cent in the base year, which declined to 60 per cent at the close of the first incentive year. The CEO was aware of this, met with the department head, and encouraged her to improve the department's PI. As noted elsewhere in the report, however, no specific, systematic steps were taken to improve its performance during the first incentive year.

The director of admitting and the assistant administrator responsible for this department speculated that the CASH standards were invalid. They explained that this department provided services to patients and physicians beyond those offered in most hospitals. According to these individuals, these services were not accounted for in developing standards, and, hence, the standards were inadequate. At the time of the first interview, the Admitting Department was undergoing a study aimed at determining the validity of those standards. The department head expressed her considerable anxiety over the low performance index of the department and over current efforts to validate standards. In her opinion, she and her staff constantly strived to provide efficient and effective service. Her comments implied that she hoped that

the hospital's administrative staff and the CASH organization would accept her explanation at face value, without probing.

The second interview with the assistant administrator responsible for CASH-IRE revealed that the Admitting Department had undergone a complete study, including standards validation and review and revision of policies, procedures, and forms. Subsequent to the study, action was taken to staff more closely in accord with demand for service. In the opinion of both this assistant administrator and the CASH representative, this department's PI improvement from 62 per cent in the second year to 78 per cent in the third year may be directly attributed to the actions just described.

The *Department of Nursing* remained stable during the first incentive year, generating an 86 per cent performance index — the same as was generated in the base year. Nursing personnel interviewed expressed enthusiasm for the CASH program and indicated that negative attitudes toward CASH, expressed when the hospital first initiated contact with the organization, had gradually dissipated. The nurses further indicated that, in the past, CASH programs had significantly contributed to improvement in the department's performance. Interviewees indicated that such programs would probably continue to contribute to departmental improvement. However, in response to questions related to specific activities aimed at improving the performance index, no such activities were described. In the opinion of the CASH representative, the nursing department was quite satisfied with its performance index. The department's stable performance during the first incentive year was reflective of this and of the extremely stable demand for nursing services during this period.

At the time of the second interview, the assistant administrator responsible for CASH-IRE stated that, despite encouragement by the hospital administration, the nursing department was reluctant to do anything to improve productivity. The surgical unit of this department was a particular target of administrative encouragement, but its performance index declined from 60 to 59 per cent between the base and first year and to 55 per cent in the second year. A slight increase — to 58 per cent — occurred in the third year. This increase appeared to be the result of a small increase in the number of cases. Overall, the nursing department performed with unusual consistency, demonstrating an 86 per cent PI in the base year and in each of the three incentive years.

Summary

Despite Hospital W's long-term, and apparently positive, relationship with CASH, the uniform high level of understanding and receptivity to the LPC and CASH-IRE programs, and, in particular, the CEO's interest and desire to improve, this hospital's performance index and its departments' component performance indices remained stable through the first incentive year. Among the explanations for this stability were:

1. The original base-year performance index computed for Hospital W (by CASH) with unaudited data was between two and three percentage points less than that calculated subsequently with audited figures. (It was not until the first incentive year was almost complete that the audited base-year performance index was computed.)
2. Both the unaudited and audited base-year performance indices of Hospital W were quite high relative both to other hospitals participating in the experiment and to all hospitals participating in the LPC program. The hospital's relatively high performance index and the related low margin for improvement may have been a factor in its not seeking more aggressively to improve its performance index.
3. A sharp mid-year decline in occupancy, without a commensurate reduction in staffing, may have contributed to the hospital's annualized stability. There is some speculation by CASH that the hospital administration may again have been lulled into a false sense of accomplishment by the high performance index shown in the first half of the year (related to high occupancy), which was offset by a decline in the latter half of the year. (A graphic analysis of performance index against occupancy made by the evaluation team reveals that this explanation may have limited value. During the first six periods of the first incentive year, the hospital's performance index averaged 85 per cent, whereas in the latter six periods it declined only one per cent to 84 per cent.)
4. The hiring of an assistant administrator responsible for management analyst services and his assumption of responsibility for CASH programs may have contributed to the stability of Hospital W. Seemingly, the administrative staff of the hospital relied heavily on this individual to promote performance index

improvement throughout the hospital. Improvement of the hospital's performance index was not a targeted goal scheduled by this individual during the first incentive year of the experiment. Rather, performance index improvement was scheduled for the latter half of the second incentive year and through the third year. Heavy reliance on this individual and on his schedule for action may have contributed to the hospital's stability.

According to the CASH representative, first incentive year levels of understanding of, and receptivity to, IRE and LPC remained unchanged through the second and third years of the experiment. The assistant administrator responsible for CASH-IRE said that he believed, primarily as a result of an improved and uniform distribution of LPC data, that interest and receptivity improved among both the administrative and the department head staffs. This assistant administrator attributed the hospital's improved PI and related incentive payments in the second and third years, in part, to improved dissemination, related increased understanding and receptivity, and improved attitudes.

The CASH representative and the assistant administrator responsible for CASH-IRE provided identical explanations for the hospital's accomplishments in the second and third years. On a hospital-wide basis, development of service demand projections and the planning of staffing accordingly, insofar as deemed possible, was seen as a significant contribution to accomplishments. With respect to specific departmental actions, both interviewees pointed to studies undertaken in the Admitting Department and in the Business Office. As indicated, a direct relationship can be established between action taken in the Admitting Department and the improved performance index. No such relationship can be established with respect to the Business Office. It was speculated that two factors may explain, in part, the lack of improvement in the Business Office:

1. A new automated data system was installed, which required the maintenance of both the automated system and the manual system for some period of time.
2. Actions taken in relation to improving the Business Office PI may have been taken at the end of, or after, the experiment.

With one exception, at the time of the first interview, all of the interviewees — both at Hospital W and at CASH — offered the consensus

that the financial incentive provided little motivation for performance improvement to either the hospital administrative staff members or the department heads. The hospital interviewees generally perceived themselves as professionals responsible for the delivery of high quality medical care in as effective and efficient a manner as possible. Thus, their perceived professional obligations caused them to continue to strive to improve care while optimizing personnel resource utilization, with financial incentives having little or no impact.

The one exception was the assistant administrator responsible for CASH-IRE — a key staff member — who said he was motivated by the financial incentive. At the time of the first interview, the hospital was entering its third incentive year of the experiment. The interviewee stated that he was highly motivated by the financial incentive and that he had established as one of his personal goals the attainment of a substantial financial incentive payment for the third incentive year of the experiment.

In the follow-up interview, the CASH representative maintained the opinion that the financial incentive offered little or no motivation for improved performance at Hospital W. The assistant administrator responsible for CASH-IRE said that, in his opinion, some motivation had been generated in the second year and, particularly, in the third year, after an incentive payment had been received for second-year improvements.

Inquiries regarding the 110 per cent charge-back feature of incentive computations also produced similar responses from the CASH representative and the assistant administrator. They agreed that some mechanism for ensuring that productivity gains were not accomplished at the expense of quality of care was necessary. They also agreed, however, that Hospital W may have, in effect, been penalized, in that the several departments performing at over 110 per cent were doing so without sacrificing quality of service.

It is significant to note several other points raised during the second interview with the assistant administrator responsible for CASH-IRE. First, he commented that he believed the implementation of the experiment at his hospital had been untimely. It had coincided with his arrival and, as a result, did not receive his full attention. The timing was also poor in that the experiment paralleled the planning for, and involvement in, hospital construction — both activities requiring considerable attention by the administrative staff. Some of this

attention might otherwise have been devoted to hospital operations in general and to the experiment in particular. Second, the assistant administrator offered the opinion that most hospital department heads require management training before they can begin to apply a tool such as the LPC program. Such a training program was instituted in the latter months of the experiment and terminated after the experiment was over. Third, the assistant administrator stated that, if the hospital were given another opportunity, such an experiment would be handled very differently. Generally, he said, it would seek greater involvement on the part of department heads and employees. Further, plans would be developed for returning incentive payments to employees.

At the time of the second interviews, the hospital was still deliberating about how to distribute the incentive payments. Of the approximately \$150,000 earned, \$25,000 had been set aside for the development of educational programs and tuition reimbursement for employees. An equitable means was being sought for distributing the balance of the money to employees.

Conclusions

A set of conclusions was drawn on the completion of the first incentive year. While these first conclusions were tentative, they are presented here together with the conclusions drawn at the completion of the experiment. The first conclusions were:

1. The financial incentive of CASH-IRE, for the most part, prompted no increase in motivation among members of the administrative staff or department head staff of this hospital to improve either departmental or overall hospital productivity indices. (The CEO at the hospital at the time the experiment was initiated was not the one there at the time of the interviews. While the former may have been motivated by the financial incentive, no evidence was found of specific programs to improve the hospital's performance index.)
2. The Labor Performance Control program was being effectively utilized by the administrative staff of the hospital to identify low-performing departments within the organizational structure. Activity in the first incentive year was, seemingly, limited to this identification process, with solution-oriented activity slated for initiation at the end of the second incentive year and during the third.
3. The retrospective approach to computing the

base-year performance index, and the time lag between its computation and an audit of the data on which it was computed, may have contributed to the hospital's failure to take action to improve its performance index. There is some evidence that the hospital was lulled into a false sense of accomplishment, owing to its being projected as a winner for most of the first incentive year — a projection based upon its unaudited base-year performance index.

4. Preliminary computations indicated that this hospital would be a minor incentive winner in the second incentive year, and a major winner in the third year. These projections suggested that, in historically well-managed institutions, the high initial performance index may be satisfying, and may result in a lag of at least one year before advantage is taken of LPC data and action initiated to earn a financial incentive. (The initial poor performer has greater margin for improvement, more leverage for urging improvement, and more options.)

Conclusions drawn at the end of the experiment were:

1. The financial incentive was clearly a motivating factor for the individual with day-to-day responsibility for CASH-IRE. Subsequent to the receipt of the first incentive payment, the hospital administrative staff and some department heads may also have been motivated by the financial incentive.

Since the assistant administrator responsible for CASH-IRE and the administrative staff were generally concerned with cost-effective operations, performance improvements cannot be directly attributed to the financial incentive.

2. Conclusion #3, drawn at the end of the first incentive year, stands as a final conclusion.
3. The LPC program was effectively used to identify low-performing departments. In at least one department (Admitting), action was initiated subject to this identification, and productivity improvement was achieved.
4. LPC reports, in part, provided the impetus for the development of a service-demand projection plan, which contributed to improved

hospital-wide labor resource allocations, as reflected by the improved overall performance index.

5. The presence of an administrative staff member with a systems and industrial engineering orientation was a major factor in this hospital's understanding and use of the LPC program and of the hospital's improved productivity.

QUANTITATIVE ANALYSIS OF EXPERIMENTAL RESULTS

The purpose of this section is to analyze experimental results quantitatively and to describe relationships among selected variables and experimental outcomes.⁶ Approaches used in the analysis were not meant to be exhaustive; rather, they were chosen on the basis of: (1) the appropriateness and efficiency of techniques in meeting evaluation objectives and (2) available resources. The variables and possible relationships considered were those believed to be the most significant from among the ones suggested by the literature, by the experimenters, by experiment participants, and by advisory groups.

The first part of the discussion describes experimental results in terms of changes in performance index, cost savings, and incentive awards earned and paid. Results for the entire experimental period are summarized in both narrative and tabular form; tabular summaries are presented for each year.

The second part explores the relationship of change in performance index to a number of selected variables. These variables include: occupancy, bed size, type of ownership, labor cost, and initial performance index. Also included are departmental performance index, motivation, and the influence of differences in the amount of time spent on experimental hospitals by CASH representatives.

⁶ Unless otherwise specified, the financial data and performance indexes shown in the tables at the end of this chapter were taken from the Plan Administrator Worksheets, which detail the incentive calculations. Occupancy figures were taken from the Annual Productivity Questionnaire's close-out reports for each hospital for each year, which were prepared by CASH. Averages and totals and totals for data presented and for changes in performance index and in size, ownership, and so forth have been calculated for this evaluation project. Some selected data have been taken from the final report of the experiment, prepared by CASH and HSSC, and have been so labelled.

The third part summarizes the relationships found, in terms of factors that might distinguish hospitals whose performance improved from those whose performance declined.

Experimental Results

As noted, this first part presents a general summary of performance and financial results, with a narrative summary that is supplemented in tabular form. (Overall results — both performance and financial — are summarized by hospital and by year in Table 1.)

Performance Results

From a possible 75 hospital/year incidents of change in performance index,⁷ 29 incidents actually resulted in such changes. Three hospitals improved their performance indexes all three years and also earned incentive awards for each experimental year; eight hospitals declined in performance all three years. The remaining 14 experienced both increases and decreases during the experiment.

⁷ 25 hospitals times three experimental years.

Table 1. Summary of Financial and Performance Results for Incentive Years and Cumulative and Overall Results by Hospital

Incentive Years												Overall ^e Change in PI
		First			Second			Third		Cumulative ^d		
Hospital	C/PI ^a	Savings ^b	Award ^c	C/PI	Savings	Award	C/PI	Savings	Award	C/PI	Savings	
A	.6	8,136	3,375	−3.8	(80,657)	(48,106)	−.8	(40,625)	(25,215)	−4.0	(113,146)	1.4
B	0.0	(1,707)	(2,806)	.6	(70,461)	(46,635)	−.6	(62,006)	(45,514)	0.0	(134,174)	.7
C	.9	233,065	84,300	1.6	159,564	76,894	−5.9	(1,723,205)	(778,604)	−3.4	(1,330,576)	−3.8
D	5.1	341,973	119,052	4.2	142,250	56,046	2.2	203,296	73,110	11.5	687,519	13.4
E	.6	6,936	3,492	−.5	(5,411)	(4,653)	−3.2	(20,460)	(10,677)	−3.1	(18,935)	−3.1
F	−.9	(179,012)	(98,040)	−.3	(42,443)	(24,846)	−1.0	18,210	(3,856)	−2.2	(203,245)	−3.2
G	2.4	8,172	5,435	−3.8	(19,881)	(18,854)	−5.0	(16,565)	(15,115)	−6.4	(28,274)	−6.5
H	−3.0	(243,535)	(92,137)	2.2	124,446	42,245	2.6	154,547	43,236	1.8	35,458	−.1
I	−2.3	(162,489)	(90,242)	2.5	125,536	63,779	.9	353,327	183,261	1.1	316,374	1.0
J	−5.8	(75,079)	(39,850)	−5.4	(36,773)	(27,074)	−3.1	(74,435)	(22,206)	−14.3	(186,287)	−14.3
K	−10.0	(480,881)	(152,071)	−8.7	(389,709)	(345,165)	−1.0	23,488	(20,624)	−19.7	(847,102)	−19.5
L	−10.8	(133,819)	(87,943)	−4.5	(69,834)	(46,559)	2.7	67,929	14,894	−12.6	(135,724)	−12.9
M	.5	36,694	3,769	4.0	76,231	15,960	3.5	71,117	10,818	8.0	184,042	8.0
N	−1.3	(5,273)	(10,667)	6.9	80,990	24,864	−8.0	(131,012)	(92,284)	−2.4	(55,295)	−3.7
O	−5.9	(47,726)	(27,076)	−1.5	(15,366)	(7,631)	−.3	(17,470)	(8,579)	−7.7	(80,562)	−7.7
P	−8.3	(1,087,732)	(263,545)	.7	(445,842)	(199,664)	−4.4	(472,407)	(184,278)	−12.0	(2,005,981)	−11.4
Q	.6	16,334	7,867	3.6	130,518	69,315	.5	(86,695)	(52,845)	4.7	60,157	6.4
R	−2.5	(143,639)	(70,062)	−3.2	(34,119)	(24,286)	1.8	22,488	9,915	−3.9	(155,270)	−3.3
S	−2.4	(86,730)	(48,975)	−5.9	(306,114)	(134,260)	−4.1	(300,809)	(133,415)	−12.4	(693,653)	−12.8
T	−7.3	(53,022)	(22,965)	−5.4	(56,566)	(33,584)	−2.1	5,125	(10,002)	−14.8	(104,463)	−9.6
U	−1.8	(39,506)	(16,749)	−4.6	(62,136)	(26,321)	−2.1	(73,082)	(80,388)	8.5	(174,724)	8.5
V	3.2	116,194	47,873	−.4	43,479	19,161	1.8	69,218	19,039	4.6	228,891	4.7
W	−.3	(21,118)	(10,538)	2.0	165,589	72,349	2.1	244,650	88,522	3.8	389,121	3.9
X	3.7	90,541	31,873	−13.3	(527,976)	(219,933)	2.1	210,761	74,752	−7.5	(226,674)	−7.4
Y	−3.1	(25,126)	(13,285)	−5.8	(95,614)	(66,308)	−5.7	(78,543)	(43,521)	−14.6	(199,283)	−15.3

^a C/PI = change in performance index.

^b Savings = equivalent cost savings.

^c Award = net total award (also called earned award).

^d Cumulative = total first year + second year + third year.

^e Overall = (third-year adjusted PI) - (base-year adjusted PI).

A comparison of base-year performance index and final-year performance index⁸ shows that eight hospitals ended the experiment with higher performance indexes than they had had in the base year. The average increase was 4.9 percentage points. The remaining 17 hospitals experienced overall declines in performance, finishing the experiment with an average performance index 8.4 percentage points lower than their average performance index.

The average adjusted performance index for all hospitals declined from 83.4 to 79.3 (4.1 percentage points) from the base year to the third incentive year. (A summary of the average adjusted

performance index of all hospitals, by various categories, is presented in Table 2.)

⁸ The base-year performance index figure used was from the first incentive year close-out report and has been adjusted by deducting cost centers that were not comparable between base and first year. The third-year performance index was from the third incentive-year report and has been adjusted by the deduction of cost centers that were comparable between second and third years. The base- and third-year performance index may not be strictly comparable in hospitals in which adjustments were made for new or deleted departments or for cost centers not comparable between previous and incentive years. However, these performance index figures are as close to being comparable as any other figures available and give some indication of overall performance change.

Table 2. Average Adjusted Performance Index* by Bed Size, Ownership, Change in Performance Index (PI), and Previous CASH Affiliation for Experimental Years

Item	First Incentive Year		Second Incentive Year		Third Incentive Year	
	Previous Year	Incentive Year	Previous Year	Incentive Year	Previous Year	Incentive Year
All hospitals (25)**	83.4%	81.5%	81.8%	80.1%	80.4%	79.3%
Size at first incentive year						
0-100 beds (8)	80.9	79.9	80.9	76.6	77.4	75.9
101-250 (6)	86.2	83.6	83.4	82.7	79.9	81.5
251-400 (8)	83.3	81.4	81.5	81.4	81.5	82.4
400+ (3)	84.9	81.7	81.6	80.4	80.3	75.6
Ownership						
Nonprofit (15)	82.2	80.9	81.2	79.6	79.8	80.0
Proprietary (5)	79.2	76.9	77.5	76.6	76.9	73.8
Government						
County (3)	94.4	87.5	87.4	82.8	83.0	79.8
District (2)	87.0	88.5	88.4	88.4	89.2	87.0
Change in PI						
PI improvers	76.6	78.5	79.9	82.4	82.5	82.8
<i>n</i>	(9)		(10)		(10)	
PI decliners	87.3	83.1	83.0	78.5	80.1	77.0
<i>n</i>	(16)		(15)		(15)	
Previous CASH affiliation (prior to experiment)						
CASH members (12)	84.0	82.5	82.4	82.9	83.1	82.2
Non-CASH members (13)	83.0	80.5	81.2	77.5	77.9	76.6

*Adjustments for each pair of years were made by eliminating data for outpatient services and for departments that were not comparable for the two years.

**Figures in parentheses = *n* for the item.

Financial Results

Financial results are described here not only in terms of cost savings but also in terms of net total awards and actual payments.

Cost Savings. Of the 75 hospital/year incidents, 30 resulted in gross cost savings, while the remaining 45 resulted in losses.⁹ (Because of the adjustments made, these incidents can be interpreted as increases or decreases in labor costs for reasons other than increases in wages or in volume or changes in service.) Seven hospitals experienced cumulative gross savings from the first to the third year — i.e., they saved more than they lost during the entire experiment. These savings totalled \$1,901,562, with a hospital average of \$271,652. (See Table 1.) The remaining 18 hospitals experienced gross losses totalling \$6,693,368, with an average loss totalling \$371,854. The entire hospital sample experienced an overall gross loss totalling \$4,791,806, with an average hospital loss of \$191,672. (Table 3 summarizes average gross savings or losses by hospital size and ownership. The table also incorporates savings or loss data by change in performance index and by incentive award status.)

Net Total Awards and Actual Payments. Of the 75 hospital/year incidents, 27 resulted in earned experimental awards totalling \$1,265,196. Because nine of the net total awards were preceded by losses, which were deducted from award amounts, actual payments by third-party payers totalled \$968,211, or \$296,985 less. (Table 4 presents a summary of total and average net incentive awards made for each of the three incentive years.)

Analysis of Individual Relationships Involving Change in Performance Index

This evaluation focused on change in performance index as representing experimental outcome. Relationships were considered between change in performance index and three sets of variables relating to: (1) specific hospital characteristics, e.g., bed size; (2) demand for service; and (3) interest in, or motivation toward, cost savings. Other variables considered in relation to change in performance index were change in labor costs, margin for improvement, and time spent on experimental hospitals by CASH consultants. Most of the proposed relationships were analyzed in terms of correlations and of apparent differences between hospitals with increases in performance index and those with decreases.

⁹ It should be noted that these are paper losses; participating hospitals that experienced them did not lose revenue nor were they penalized financially.

In addition to the analysis of aggregate hospital data, a brief analysis was made of change in performance index for individual departments. The following paragraphs describe, in more detail, the relationships considered important and discuss significant findings.¹⁰

Analysis of Aggregate Hospital Data

This analysis of aggregate hospital data focuses on differences between hospitals whose performance improved and those whose performance declined, in terms of each of the variables analyzed.

Bed Size and Ownership. Relationships were analyzed between change in performance index and two hospital characteristics — bed size and type of ownership.¹¹ Findings of these analyses, which are summarized in Table 5, indicate that no overall statement can be made relating change in performance index to number of beds — e.g., “the larger the hospital, the larger the increase (or, alternatively, the decrease) in performance index.” However, findings do show that hospitals in the 251 to 400 bed category did “better” than those in the other size groups for the second and third years. They also did better with respect to change in performance index from the base year to the third year, having smaller average decreases. The 400+ size category showed the largest overall decreases in performance index, except in the second year.

Some explanations of these findings have been proposed. The most plausible is related to scale. It is possible that the 251 to 400 bed hospitals are more likely to have staff persons trained in labor productivity improvement techniques. Such staffing requires a financial status that would set these hospitals apart from smaller hospitals which do not have the critical mass necessary so that they can hire trained staffs and support programs for improving productivity. It can also be argued that, unlike the even larger hospitals, the 251 to 400 bed hospitals are sufficiently small and unbureaucratized to be adaptive enough to overcome inherent inertia to change. Other attributes of the 251 to 400 bed category — such as a high and, possibly, more stable occupancy rate — may also contribute

¹⁰ Significance of results was determined at the $\alpha = .05$ level for correlations and for t-tests in comparing hospitals whose performance index improved with those whose index declined.

¹¹ Because of the variation in the variables among size and ownership categories, summary data are presented for categories in the tables. However, because of the small size of most of these categories and because of related problems of interpretation and generalization, results of statistical analyses are not presented in the narrative.

**Table 3. Average Gross Savings (Losses) by Bed Size, Ownership,
Change in Performance Index (PI), and Award Status for Incentive Years**

<i>Item</i>	<i>Incentive Years</i>			<i>Overall Total *</i>
	<i>First</i>	<i>Second</i>	<i>Third</i>	
All hospitals (25) **	(\$77,134)	(\$48,412)	(\$66,126)	(\$191,672)
Size at first incentive year				
0-100 beds (8)	3,076)	(90,655)	14,168	(73,412)
101-250 (6)	(20,192)	14,374	(38,013)	(43,830)
251-400 (8)	(111,301)	2,636	119,750	11,085
400+ (3)	(313,799)	(197,464)	(832,140)	(1,343,403)
Ownership				
Nonprofit (15)	(12,300)	(8,137)	(34,411)	(54,849)
Proprietary (5)	(22,601)	(11,443)	(56,800)	(90,845)
Government				
County (3)	(551,781)	(380,555)	(249,909)	(1,182,245)
District (2)	12,253	55,319	(51,630)	15,941
Change in PI				
PI improvers	95,344	48,882	131,064	NA***
<i>n</i>	(9)	(10)	(10)	
PI decliners	(174,150)	(113,275)	(197,586)	NA
<i>n</i>	(16)	(15)	(15)	
Incentive award status				
Award-earners	95,344	116,511	155,259	NA
<i>n</i>	(9)	(9)	(9)	
Non-award earners	(174,150)	(141,181)	(190,656)	NA
<i>n</i>	(16)	(16)	(16)	

*Total of the first, second and third year savings (losses) for all hospitals in the category divided by the number of hospitals in the category.

**Figures in parentheses = *n* for the item.

***NA = Not applicable.

**Table 4. Net Incentive Awards (Hospital Total and Average per Hospital) for
Hospitals Earning an Award, in Incentive Years**

	<i>Incentive Years</i>			
	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>Total</i>
Total	\$307,036	\$440,613	\$517,547	\$1,265,196
Average	34,115	48,957	57,505	46,859
<i>n</i>	(9)	(9)	(9)	(27)

Table 5. Average Change in Adjusted Performance Index* by Bed Size, Ownership, Change in Performance Index (PI), Award Status, and Previous CASH Affiliation for Incentive years

<i>Item</i>	<i>Incentive Years</i>		
	<i>First</i>	<i>Second</i>	<i>Third</i>
All hospitals (25) **	-1.9	-1.6	-1.1
Size at first incentive year			
0-100 beds (8)	-1.1	-3.8	-1.4
101-250 (6)	-2.7	-.7	-1.4
251-400 (8)	-1.7	-.1	.9
400+ (3)	-3.3	-1.2	-4.8
Ownership			
Nonprofit (15)	-1.2	-1.4	.2
Proprietary (5)	-2.4	-.9	-3.1
Government			
County (3)	-6.9	-4.6	-3.2
District (2)	-1.5	-.1	-2.3
Change in PI			
PI improvers	2.0	2.8	2.0
<i>n</i>	(9)	(10)	(10)
PI decliners	-4.1	-4.5	-3.2
<i>n</i>	(16)	(15)	(15)
Incentive award status			
Award earners	2.0	3.0	2.2
<i>n</i>	(9)	(9)	(9)
Nonaward earners	-4.1	-4.8	-2.9
<i>n</i>	(16)	(16)	(16)
Previous CASH affiliation (prior to experiment)			
CASH members (12)	-1.3	.5	-.9
Non-CASH members (13)	-2.5	-3.4	-1.3

*Change in Adjusted Performance Index = Adjusted incentive-year performance index minus adjusted previous-year performance index.

**Figures in parentheses = *n* for the item.

to the more favorable performance. On the other hand, it has also been suggested that the better performance of this size group occurred merely by chance and that the same phenomenon would not occur with a larger sample or with the hospital universe.

The poor performance of the 400+ bed category may be explained by ownership. Two of the three experimental hospitals in this category were county hospitals. And, as noted in the following paragraphs, county hospitals did not perform as well as other hospitals in this experiment.

In terms of ownership, hospitals in the nonprofit group did consistently better, throughout the experiment, than did those in the proprietary or government groups. Nonprofit hospitals had the smallest decrease in performance and the smallest gross losses per hospital. The county hospitals (government category) had the largest decrease in performance and the largest losses. Moreover, no county hospital earned an incentive award. The district hospitals (government category), however, showed results approximating those of nonprofit hospitals, which is consistent with their functional and operational similarity to nonprofit hospitals (in California).

The consistent better performance of the nonprofit group may be explained, in part, by the fact that many of the nonprofit hospitals were in the 251 to 400 bed size category. As noted earlier, hospitals in this group consistently performed better than did hospitals in other groups. Additionally, it is speculated that the nonprofit hospitals may have more enthusiastically pursued labor productivity improvements, while proprietary hospitals were emphasizing other approaches to achieving excesses of revenue over expenses, and county hospitals were attempting to close an image and service gap between themselves and the community hospitals.

County hospitals, particularly, may have lacked the motivation necessary to change, because of their legislated role, their size, their more bureaucratic nature, and their historical orientation to appropriation budgets. Moreover, as indicated, the experimental period coincided with a period in which county hospitals in California were attempting to change their image from that of hospitals of last resort for the poor to an image more closely approximating that of the community hospital. With larger budgets available to accomplish this image change and with the general perceived need to improve staffing, the Incentive Reimbursement Experiment and labor productivity may well have

been of secondary concern, at best, in these hospitals.

Demand for Service. Several hypotheses were proposed that related change in performance index with various aspects of demand for service. In this area, statistical relationships were considered between change in performance index and each of the following: (1) average annual occupancy, (2) turnover (number of admissions per year/average number of beds), (3) average length of stay, and (4) changes in all of the foregoing.

Change in demand for service — as indicated by change in occupancy — was hypothesized to have the most influence on change in performance index. No significant correlation was found between change in performance index and change in occupancy; thus changes in other indicators of demand were considered. (Table 6 presents average occupancy rates for all hospitals and by bed size, ownership, and change in performance index for the three experimental years.) The only significant relationship found was for the second year. That year change in performance index exhibited a weak but significant relationship to change in annual turnover. This can be stated as the smaller the decrease in turnover (or the larger the increase), the larger the increase in performance index.

Other indicators considered included occupancy level (as opposed to change), annual turnover, and annual length of stay. Analysis showed that occupancy level was related to change in performance index, with higher occupancy level corresponding to larger increases (or smaller decreases) in performance index. However, the relationship was significant only for the first two years of the experiment. Findings also suggest that there may be an occupancy level below which it becomes difficult to improve performance index. Moreover, since higher annual occupancy is usually associated with a more stable month-to-month rate, the stability of occupancy appears to influence performance change. In this evaluation, however, it was possible to analyze average annual occupancy only — not month-to-month figures — and, therefore, this hypothesis could not be validated.

Analysis of the relationship between change in performance index and annual admissions per bed (annual turnover) showed that, in the first year, larger increases in performance index corresponded to greater turnover (and larger decreases in performance index to smaller turnover) — enough to indicate a weak but significant relationship. The direction of the relationship remained constant for

Table 6. Average Occupancy Rate by Bed Size, Ownership, and Change in Performance Index (PI) for Experimental Years

Item	Incentive Years			
	Base Year	First	Second	Third
All hospitals (25) *	73.8%	72.5%	68.4%	64.0%
Size at first incentive year				
0-100 beds (8)	75.0	73.1	65.8	61.5
101-250 (6)	71.2	70.0	65.2	61.8
251-400 (8)	76.9	76.9	74.5	69.4
400+ (3)	68.0	64.3	65.3	60.7
Ownership				
Nonprofit (15)	78.3	76.7	74.1	66.9
Proprietary (5)	67.8	65.0	54.0	53.8
Government				
County (3)	59.0	57.3	56.0	52.7
District (2)	78.0	82.5	79.5	84.5
Change in PI				
PI improvers	NA**	78.7	75.4	70.7
<i>n</i>		(9)	(10)	(10)
PI decliners	NA	69.1	63.7	59.5
<i>n</i>		(16)	(15)	(15)

*Figures in parentheses = *n* for the item.

**NA = Not applicable.

the second and third years, but the relationships are not significant.

Motivation. The literature review, the case studies, and the experimental data all suggested the possible influence of motivation on change in performance. As a result, two indicators of motivation were considered: (1) response to receipt of a financial payment, indicating experimental motivation, and (2) hospital membership in CASH prior to the experiment, a proxy measure of self-initiated motivation.

It had been hoped that the offer of a financial incentive would encourage improvement in performance index and that receipt of an incentive award would motivate hospitals to continue to increase their performance index. However, results indicated that the experiment, with its financial incentive, provided little motivation for improvement. Only three hospitals increased their perfor-

mance index all three years of the experiment. Of the hospitals that had increases in performance index during the first or second year, almost half had decreases for the second or third years, respectively. (Again, it should be noted that the effect of the financial incentive may have been lessened by: [1] the time lag between when a hospital won an award and when it received it; [2] the insignificant amount of the award, as compared to total hospital budget; and [3] the fact that employees did not share in awards.)

Evaluation results show that hospitals having had no affiliation with CASH prior to the experiment exhibited consistently larger average decreases in performance index than did CASH-affiliated hospitals. However, the differences between the two groups were significant only for the second year. While some hospitals subscribe to CASH because it is "the thing to do," prior CASH membership (as a proxy measure of motivation) indicated that a

CASH member was more likely to do better in terms of desired performance change. Thus, the findings give some support to the hypothesis that hospital-initiated motivation is necessary for improvement.

Margin for Improvement. Margin for improvement had been suggested as a possible influence on change in performance index. It might be easier, for example, for a hospital with a performance index of 60 to achieve a five percentage point increase than it would be for a hospital with an index of 90. In support of this hypothesis, evaluation data indicate that higher initial (base-year) performance levels were often followed by larger first-year declines in performance index (and lower performance levels by increases). However, relationships between performance index and previous year's performance index were not significant for the second and third year. Thus, while first-year results tended to support the hypothesis that larger increases are more likely to be achieved by low-performing hospitals, the lack of support by second- and third-year results suggests that no generalization can be made. It also indicates that initial impact of the experimental program may differ greatly from lasting effects or that environmental conditions may have been different in the first year than in the last two years.

Time Spent by CASH Representatives. The amount of time spent on experimental hospitals by CASH representatives (management engineers) had also been considered as a possible influence on change in performance index. Experimental results showed considerable variation among hospitals in both

total annual (CASH) engineering time and average annual engineering time per bed. (Table 7 presents a summary of maximum/minimum time spent per hospital and per bed for the three incentive years; Table 8 presents the average number of days and the average number of days per bed for all hospitals and by various categories.)

An analysis of the overall findings, however, shows that no significant correlations exist between either change in performance index and engineering time per hospital or between change in performance index and engineering time per bed.

Labor Costs. As stated earlier, the two major objectives of the experiment were improvement in labor productivity and the assumedly related control of labor costs. For the first and third incentive years, larger increases in performance index often corresponded to larger decreases in adjusted inpatient payroll cost per patient day (after the previous-year figure for wage or volume change was adjusted). This indicates that increasing labor efficiency is, indeed, one influence on controlling labor costs. (Tables 9, 10, and 11 present average inpatient payroll and average changes in inpatient payroll and adjusted inpatient payroll per patient day.)

Analysis of Departmental Data

All of the preceding relationships were analyzed from aggregate hospital data. Because departments (labor cost centers) in each hospital varied greatly in performance index and in change in performance index, some evaluation of individual depart-

Table 7. Maximum/Minimum Days per Hospital and per Bed Spent by CASH Representatives During Incentive Years

<i>Item</i>	<i>Incentive Years</i>		
	<i>First</i>	<i>Second</i>	<i>Third</i>
Per hospital			
maximum days	124.0	67.6	102.0
minimum days	12.3	9.3	11.4
Per bed			
maximum days .....	.84	.52	.87
minimum days .....	.11	.06	.08

Source: *Incentive Reimbursement Experiment, 1969-1973*. Los Angeles: Blue Cross of Southern California, 1973.

**Table 8. Average Number of Days and Average Number of Days per Bed
Spent by CASH Representatives for All Hospitals and for
Subgroups, Determined by Change in Performance Index (PI), for Incentive Years**

Item	Incentive Years			Total
	First	Second	Third	
Average per hospital				
All hospitals (<i>n</i> = 25)	44.1	33.4	41.5	119.0
Change in PI				
PI improvers	46.5	39.7	48.3	129.5
<i>n</i>	(9)	(10)	(10)	(8)
PI decliners	42.7	29.2	37.0	114.1
<i>n</i>	(16)	(15)	(15)	(17)
Average per bed				
All hospitals (<i>n</i> = 25) . . . . .	.27	.19	.21	.67
Change in PI				
PI improvers . . . . .	.40	.13	.21	.69
PI decliners . . . . .	.19	.22	.22	.66

Source: *Incentive Reimbursement Experiment, 1969-1973*. Los Angeles: Blue Cross of Southern California, 1973.

Table 9. Average Inpatient Payroll* Cost per Patient Day by Bed Size, Ownership, and Change in Performance Index (PI) for Experimental Years

<i>Item</i>	<i>Base Year</i>	<i>Incentive Years</i>		
		<i>First</i>	<i>Second</i>	<i>Third</i>
All hospitals (25) **	\$52.14	\$58.44	\$64.92	\$71.56
Size at first incentive year				
0-100 beds (8)	46.43	51.21	61.81	64.01
101-250 (6)	48.92	48.83	53.43	60.17
251-400 (8)	53.29	60.33	66.64	71.05
400+ (3)	70.80	91.87	91.63	115.83
Ownership				
Nonprofit (15)	54.75	59.25	66.44	72.65
Proprietary (5)	44.62	49.82	56.28	61.46
Government (5)	60.80	64.60	69.10	78.40
County (3)	57.27	76.78	81.64	95.86
District (2)	43.74	46.30	50.10	52.16
Change in PI				
PI improvers	NA***	60.00	68.20	66.70
<i>n</i>		(9)	(10)	(10)
PI decliners	NA	57.60	62.80	74.80
<i>n</i>		(16)	(15)	(15)

**Inpatient payroll = total payroll minus amount attributable to outpatient service and cost centers not comparable between incentive and previous year.*

***Figure in parentheses = n for the item.*

****NA = Not applicable.*

**Table 10. Average Change in Inpatient Payroll Cost per Patient Day
by Bed Size, Ownership, and Change in Performance Index (PI)
for Incentive Years**

<i>Item</i>	Incentive Years			
	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>Total</i>
All hospitals (25) *	\$6.30	\$6.50	\$6.64	\$19.44
Size at first incentive year				
0-100 beds (8)	4.79	10.60	2.20	17.59
101-250 (6)	0.08	4.62	6.73	11.27
251-400 (8)	7.04	6.30	4.41	17.75
400+ (3)	21.10	0.23	24.17	45.04
Ownership				
Nonprofit (15)	4.51	7.19	6.21	17.91
Proprietary (5)	5.22	6.44	5.18	16.84
Government (5)	3.80	4.44	9.30	17.54
County (3)	19.51	4.86	14.22	38.59
District (2)	2.57	3.80	2.06	8.43
Change in PI				
PI improvers	5.10	2.00	2.04	NA **
<i>n</i>	(9)	(10)	(10)	
PI decliners	6.90	9.57	9.70	NA
<i>n</i>	(16)	(15)	(15)	

**Figures in parentheses = n for the item.*

***NA = Not applicable.*

Table 11. Average Change in Adjusted* Inpatient Payroll Cost per Patient Day by Bed Size, Ownership, and Change in Performance Index (PI) for Incentive Years

<i>Item</i>	<i>Incentive Years</i>		
	<i>First</i>	<i>Second</i>	<i>Third</i>
All hospitals (25)**	\$0.64	\$0.78	\$-0.12
Size at first incentive year			
0-100 beds (8)	1.49	-0.31	-7.09
101-250 (6)	-3.93	1.08	2.10
251-400 (8)	0.48	1.99	-0.46
400+ (3)	8.00	-0.17	14.87
Ownership			
Nonprofit (15)	-1.22	1.24	-2.08
Proprietary (5)	3.12	-0.04	1.12
Government			
County (3)	11.11	6.47	9.03
District (2)	-7.30	-8.16	-2.31
Change in PI			
PI improvers	-2.80	-3.50	-7.50
<i>n</i>	(9)	(10)	(10)
PI decliners	2.60	3.60	4.80
<i>n</i>	(16)	(15)	(15)

*Adjusted previous year inpatient payroll = (inpatient payroll) x

$$\frac{\text{incentive year standard hours}}{\text{previous year standard hours}} \times \frac{\text{incentive year average wage}}{\text{previous year average wage}}.$$

Change in adjusted inpatient payroll cost per patient day = (incentive year inpatient payroll cost per patient day) - (adjusted previous inpatient payroll cost per patient day).

**Figures in parentheses = *n* for the item.

ment data was deemed appropriate. However, it was not deemed feasible to conduct detailed statistical analyses similar to those used for analysis of aggregate hospital data. Thus, empirical comparisons and observations of performance index and change in performance were conducted for individual cost centers or for groups of cost centers. (Table 12 presents a summary of the comparison of performance change in selected major departments for the second and third incentive years.)

Results of these analyses suggest that no overall generalization of performance change can be made,

based on whether departments are considered direct patient care or nonpatient care departments; however, some statements can be made for specific departments within the two categories. Among direct patient care departments, nursing generally declined in performance, while others improved. Among nonpatient care departments, "hotel-type" service departments often increased in performance index, while departments with primarily clerical functions generally declined.

The starting performance level seemed to have little influence on the improvement or decline in performance index. Radiology departments gener-

Table 12. Summary of Comparison of Performance Change in Selected Major Departments for Second and Third Incentive Years

Department	Average First Year Performance	Per cent Performance Change in Second Year	Number of Second Year Improvers/Decliners	Per cent Performance Change In Third Year	Number of Third Year Improvers/Decliners	Cumulative Performance Change for Second Through Third Years
Medical/surgical nursing . . .	79%	-1.85%	6/19	- 1.21%	13/12	- 3.06%
Pediatric nursing	79	-4.22	5/7	- 1.70	6/6	- 5.92
ICU nursing	77	- .27	9/9	- 9.89	9/9	-10.16
Obstetrical nursing	71	-6.71	1/16	+ 3.92	9/8	- 2.79
Admitting	66	- .27	4/6	- 1.79	5/5	- 2.06
Business office	82	-6.46	13/11	- 3.71	7/17	-10.17
Central service	68	-3.41	10/11	- 3.85	8/13	- 7.26
Dietary	90	+2.74	14/11	+ .43	14/11	+ 3.17
Emergency	61	-7.56	6/13	- 1.73	11/8	- 9.29
Housekeeping	96	+2.18	14/9	+ .95	12/11	+ 3.13
Inhalation therapy	79	+6.44	10/4	+ 4.00	10/3	+10.44
Laboratory	75	+1.54	10/8	+ .73	11/7	+ 2.27
Laundry/linen	84	+3.46	9/5	+ 1.67	7/8	+ 5.13
Maintenance	87	+3.85	15/7	+ 5.80	14/8	+ 9.65
Medical records	76	-3.20	7/16	- 2.04	9/14	- 5.24
Pharmacy	80	-4.04	6/14	- 5.65	7/13	- 9.69
Physical therapy	78	+2.08	6/4	+11.96	6/4	+14.04
Radiology	68	+1.83	12/11	+ 2.06	9/14	+ 3.89
Surgery/recovery	55	+2.40	17/8	- 1.17	11/14	+ 1.23

Source: *Incentive Reimbursement Experiment, 1969-1973*. Los Angeles: Blue Cross of Southern California, 1973.

ally began with very low performance levels, while dietary and housekeeping departments usually began with high levels. Yet all three types of departments achieved average increases in performance index. Declines in performance index were exhibited by departments that began with both relatively high and relatively low performance levels.

In most departments, average improvement in performance was usually accompanied by average increase in volume. Two notable exceptions were

the maintenance and medical record departments, where those with increases in performance index had average declines in total volume.

Analysis of Combined Relationships

The following analysis of combined relationships includes both a discussion of factors that distinguish hospitals whose performance indexes improved from those whose indexes did not improve and summarizes relationships in terms of a linear regression model.

Distinguishing Factors

Another approach to analyzing results was to determine whether hospitals that improved in performance index were distinguishable from hospitals whose performance index declined, in terms of any of the variables previously considered. The results of comparisons were seldom both significant and consistent over all three years.

For the first year, hospitals improving their performance indexes had, on the average, increases in occupancy and decreases in adjusted payroll costs, while hospitals with declining performance indexes had decreases in occupancy and increases in cost. Hospitals whose performance indexes improved had higher average occupancy and turnover, shorter average length of stay, lower initial performance indexes, and more CASH engineering time per bed than hospitals whose performance indexes declined.

For the second year, hospitals whose performance indexes improved had an average decrease in adjusted payroll costs per patient day, an average increase in length of stay, and a higher occupancy rate, while hospitals whose performance indexes declined had an average increase in costs, an average decline in length of stay, and a lower occupancy rate.

For the third year, hospitals that improved had higher occupancy and higher turnover than did those that declined. The former also had cost decreases, while the latter had increases.

It should be pointed out that most of the hypothesized relationships were not substantiated by experimental data, which gives credibility to the belief that each hospital is different in so many ways that no generalizations can be made. It appears possible that, as the case studies suggest, major influences on change in performance are subjective hospital characteristics — e.g., an administrator who is really interested in a proposed system and works actively to implement it.

Results also indicate that few relationships existed that were both statistically significant and constant over the years. Relationships in the first year were often different (either in degree or in direction) from those in the third year, which may suggest that influences on initial performance change are different from those on later change.

Linear Regression Models

The following paragraphs attempt to summarize the previously explained relationships between

change in performance index and other selected variables into a single function in terms of a linear regression model. It was decided that only annual data would be used in the analysis because of the problems of availability and validity of data.¹² The analysis includes most of the variables involved in the previous section: change in performance index (independent variable), previous year's performance index, occupancy, number of beds, CASH engineering days, previous CASH affiliation (dummy variable), change in occupancy (incentive year minus previous year), average annual turnover, per cent change in turnover, average length of stay (LDS), per cent change in length of stay, and CASH engineering days per bed. Ownership was not included because of its categorical nature and because of the correlation between ownership and bed size in the experimental group.

Models were developed, with the use of the stepwise regression technique, that included the list of variables for each of the three years. Data for the entire sample were considered for the major set of models; in addition, secondary models were developed, excluding the three county hospitals because of their outlier nature in many of the individual relationships. Complete regression models, including pertinent statistics, appear in Tables 13 (a,b,c) and 14 (a,b,c). An interpretation of the models follows.

The models developed for the first and second years, based on the entire sample, can be considered satisfactory in the amount of variation in change in performance index explained (79 per cent and 73 per cent for the first and second years, respectively). The first-year model indicates that the three most important variables, which together explained 67 per cent of the variation in change of performance index, were occupancy (42 per cent), previous year's performance index (18 per cent), and per cent change in turnover (7 per cent).

For the second year, the most important variables, in terms of explained variation in the complete

¹² An extensive exploration of first-year monthly data was made early in the evaluation, using variables that had, at that time, been proposed as possibly significant. Variables included: monthly standard hours, hours worked, patient days and average daily census, number of beds, occupancy and change in occupancy, monthly and base-year performance index, and dummy variables for each of the 12 months. Several linear regression models were considered, in an attempt, mainly, to explain performance index in terms of other variables. It appeared that the base-year performance index contributed the most to an explanation of the monthly performance index and that the dummy variables had little explanatory power. Further analysis was deemed necessary, especially in attempting an explanation of change in the performance index, which was one of the major variables indicating experimental outcome.

**Table 13a. Linear Regression Model, Including All Hospitals,
First Year, With Change in Performance Index (PI) as Dependent Variable
(*n*=25)**

Variable	Variables in Equation		
	Coefficient	Standard Error	Contribution to R^2 *
(CONSTANT	24.01961)		
2 Previous PI	-0.33071	0.09156	0.1825
3 Occupancy	0.31727	0.14327	0.4171
4 Bed size	0.01317	0.01441	0.0072
5 Engineering days	-0.07424	0.05946	0.0269
6 Previous CASH member	0.99919	2.32592	0.0193
7 Change in occupancy	-0.11664	0.14278	0.0108
8 Turnover	-0.28413	0.19276	0.0171
9 Per cent change in turnover	17.25879	9.16834	0.0722
10 Length of stay	-1.81684	1.36586	0.0068
11 Per cent change in LOS	4.86647	4.70995	0.0093
12 Engineering days/bed	7.50126	5.18936	0.0206
Total	—	—	0.7898
Multiple R	0.8887		
Standard Error of Estimate	2.5888		

Analysis of variance

	DF	Sum of Squares	Mean Square	F Ratio
Regression	11	327.179	29.744	4.438
Residual	13	87.124	6.702	

*"Contribution to R^2 " is the increase in R^2 when the variable was added to the model during the stepwise regression procedure.

model, were per cent change in turnover (20 per cent), occupancy (18 per cent), previous year's performance index (10 per cent), engineering days per bed (13 per cent), and turnover (5 per cent).

The third-year model is substantially different from those of the first two years, with the most important variables being previous CASH affiliation (11 per cent), change in occupancy (9 per cent), occupancy (6 per cent), and length of stay (6 per cent). The complete model explains only a small (nonsignificant) proportion of the variation in change in performance index (38 per cent).

For the first and second years, the secondary models, which excluded the three county hospitals, explained the same variation for the first year and slightly more variation in the second year (79 per cent and 83 per cent, respectively) than did the primary models, which included all 25 experimental hospitals. The notable difference between primary and secondary models is that occupancy is less important when county hospitals are excluded.

Again, in the secondary models, three variables appear most important for the first year — previous year's performance index (36 per cent), occupancy (27 per cent), and per cent change in turnover (5 per cent).

For the second year, the most important variables in the complete model were per cent change in turnover (30 per cent), engineering days per bed (29 per cent), and turnover (6 per cent).

As in the full-sample model for the third year, previous CASH affiliation (13 per cent) and change in occupancy (10 per cent) accounted for a major portion of the explained variance. Again, however, the complete model accounts for only a small (nonsignificant) portion of the variation in change in performance index (38 per cent).

Overall, the regression analyses emphasized again the lack of constancy of results among years. First-year models were substantially different from third-year models, with the second-year models

**Table 13b. Linear Regression Model, Including All Hospitals,
Second Year, With Change in Performance Index (PI) as Dependent Variable
(n=25)**

Variable		Variables in Equation		Contribution to R ²
		Coefficient	Standard Error	
(CONSTANT		24.66939)		
2	Previous PI	−0.32908	0.14061	0.1045
3	Occupancy	0.30797	0.14633	0.1771
4	Bed size	0.01037	0.01382	0.0147
5	Engineering days	−0.08768	0.10684	0.0141
6	Previous CASH member	−2.38410	2.70394	0.0190
7	Change in occupancy	−0.27938	0.20104	0.0043
8	Turnover	−0.07310	0.18139	0.0545
9	Per cent change in turnover	23.73859	8.13216	0.1971
10	Length of stay	−1.74175	1.32497	0.0080
11	Per cent change in LOS	−9.32702	13.21010	0.0047
12	Engineering days/bed	−27.82091	9.82682	0.1289
Total		—	—	0.7269
Multiple R		0.8526		
Standard Error of Estimate		3.2892		
Analysis of variance				
	DF	Sum of Squares	Mean Square	F Ratio
Regression	11	374.477	34.043	3.147
Residual	13	140.643	10.819	

closer to the first than to the third. Results suggest that the initial impact of the LPC program and the financial incentive was different from longer-term effects. The three most important variables in accounting for variation in change in performance index were occupancy, previous year's perfor-

mance index, and per cent change in turnover for both the first and second years. No variable considered in the models accounted for a significant amount of variation in change in performance index in the third year.

Table 13c. Linear Regression Model, Including All Hospitals,
Third Year, With Change in Performance Index (PI) as Dependent Variable
(*n*-25)

Variable *	Variables in Equation		Contribution to R ²
	Coefficient	Standard Error	
(CONSTANT	-6.60482)		
2 Previous PI	-0.06347	0.10057	0.0165
3 Occupancy	-0.27054	0.23265	0.0592
4 Bed size	-0.00234	0.00796	0.0041
6 Previous CASH member	4.33010	2.56082	0.1051
7 Change in occupancy	0.13471	0.08353	0.0908
8 Turnover	0.43988	0.35508	0.0107
9 Per cent change in turnover	2.43098	4.92794	0.0280
10 Length of stay	1.65351	1.76192	0.0566
11 Per cent change in LOS	-5.84615	14.16389	0.0049
12 Engineering days/bed	0.56441	5.25984	0.0005
Total	—	—	0.3765
Multiple R	0.6136		
Standard Error of Estimate	3.2853		
Analysis of variance			
	DF	Sum of Squares	Mean Square
Regression	10	91.248	9.125
Residual	14	151.106	10.793
			F Ratio
			0.845

*Variable 5 did not meet the stepwise regression method criterion for entering this model and was, therefore, excluded by the computer program from calculations; any variables omitted from subsequent tables also failed to meet the criterion.

**Table 14a. Linear Regression Model, Excluding County Hospitals,
First Year, With Change in Performance Index (PI) as Dependent Variable
(n=22)**

Variable	Variables in Equation		Contribution to R ²
	Coefficient	Standard Error	
(CONSTANT	29.13057)		
2 Previous PI	−0.38423	0.09039	0.3575
3 Occupancy	0.37838	0.15092	0.2680
5 Engineering days	−0.05177	0.03431	0.0105
6 Previous CASH member	2.36882	1.99482	0.0272
7 Change in occupancy	−0.13192	0.14718	0.0082
8 Turnover	−0.32466	0.20349	0.0172
9 Per cent change in turnover	17.64754	9.44271	0.0520
10 Length of stay	−2.11785	1.45953	0.0196
11 Per cent change in LOS	9.06922	6.03117	0.0178
12 Engineering days/bed	5.18843	4.02802	0.0094
Total	—	—	0.7875
Multiple R	0.8874		
Standard Error of Estimate	2.3995		
Analysis of variance			
	DF	Sum of Squares	Mean Square
Regression	10	234.740	23.474
Residual	11	63.333	5.758
			F Ratio
			4.077

**Table 14b. Linear Regression Model, Excluding County Hospitals,
Second Year, With Change in Performance Index (PI) as Dependent Variable
(*n*=22)**

Variable	Variables in Equation		Contribution to R ²	
	Coefficient	Standard Error		
(CONSTANT	12.20071)			
2 Previous PI	−0.16027	0.13119	0.0283	
3 Occupancy	0.06476	0.14124	0.0326	
4 Bed size	−0.04291	0.02969	0.0063	
5 Engineering days	0.32160	0.23954	0.0164	
7 Change in occupancy	0.04097	0.20753	0.0262	
8 Turnover	0.13842	0.15968	0.0590*	
9 Per cent change in turnover	20.58789	6.70384	0.3019	
10 Length of stay	−0.16890	1.29440	0.0235	
11 Per cent change in LOS	−23.47701	11.34957	0.0313	
12 Engineering days/bed	−49.36047	12.29073	0.2922	
Total	—	—	0.8177	
Multiple R	0.9107			
Standard Error of Estimate	2.6017			
Analysis of variance				
	DF	Sum of Squares	Mean Square	F Ratio
Regression	10	361.710	36.171	5.344
Residual	11	74.456	6.759	

**Variable 8 contributed an additional .0590 to R^2 when it was first added to the model during the stepwise process. The variable was deleted from the model in a subsequent step, diminishing R^2 by .0001; it was then added a second time during a subsequent step, contributing an additional .0118 to R^2 .*

**Table 14c. Linear Regression Model, Excluding County Hospitals,
Third Year, With Changes in Performance Index (PI) as Dependent Variable
(n=22)**

Variable	Variables in Equation		Contribution to R ²	
	Coefficient	Standard Error		
(CONSTANT	−12.55123)			
3 Occupancy	−0.38671	0.29717	0.0080	
4 Bed size	0.00192	0.02488	0.0027	
5 Engineering days	−0.03270	0.09794	0.0062	
6 Previous CASH member	5.89377	5.66438	0.1341	
7 Change in occupancy	0.15690	0.09514	0.1037	
8 Turnover	0.55248	0.44045	0.0769	
9 Per cent change in turnover	3.07880	6.53744	0.0198	
10 Length of stay	2.18994	2.20933	0.0294	
11 Per cent change in LOS	−5.35131	16.17664	0.0031	
12 Engineering days/bed	3.42540	9.92682	0.0009	
Total	—	—	0.3849	
Multiple R	0.6204			
Standard Error of Estimate	3.5113			
Analysis of variance				
	DF	Sum of Squares	Mean Square	F Ratio
Regression	10	84.859	8.486	0.688
Residual	11	135.621	12.329	

DEFINITIVE CONCLUSIONS AND RECOMMENDATIONS

The following definitive list of conclusions and recommendations has been drawn from the various component evaluations, including the case studies, conducted as part of the overall evaluation project. Conclusions and recommendations have been grouped as follows: (1) the LPC program, on which the experiment was based; (2) the techniques and procedures used in conducting the experiment; and (3) the overall results. The last category covers the effect of improved productivity on quality of care, influencing factors, and statistical results.

THE LPC PROGRAM

The conclusions and recommendations presented here have been derived from a definitive, evaluative analysis of the LPC program — design and process. This analysis has been described and the results summarized in Working Papers Nos. 4 to 6 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four, and in the case study reports, Part Three of the same publication.

Design

Conclusions

1. The LPC standards developed for specific tasks performed in each hospital cost center reasonably represent what they purport to: the time required to perform tasks, as measured by "traditional industrial engineering concepts that equate a 100 per cent performance index to a production level equivalent to a 'fair day's work.'"
2. Methods and procedures used in collecting and reviewing detailed operating data during the 28-day (or one-month) control period are less than adequate.
 - a. Although hospital personnel are requested to submit accurate data, which are carefully scrutinized, the procedure cannot be characterized as adequate to ensure validity of data.
 - b. The review of control-period data, which attempts to ensure that the standards reflect each hospital's unique operating methods, conditions, and characteristics, is not valid or reliable.
3. Ongoing data reporting and monitoring procedures, which follow the control period and are essentials of the LPC program, are inadequate to ensure equity for experimental sponsors or participants.
 - a. The procedure of having hospital staffs voluntarily report changes in operations that may affect the initially developed performance standards does not adequately ensure equity for sponsors or participants.
 - b. Systems and procedures used by CASH to monitor, detect, and ensure against erroneous reporting, or failure to report changes, are inadequate. They do not provide for detection of, or insurance against, the inaccurate reporting of work volume, the initiation or deletion of services, the acquisition of performance-related equipment, and so forth.
4. When a department adds, deletes, or changes the mix of definitive tasks performed, validity is lost in relation to the collection of data on the performance of definitive tasks for the 28-day (or one-month) period, the conversion of data to a standard basis, and the subsequent determination of standard-hour requirements.
5. If valid data are submitted on a timely basis, the LPC program is an effective tool for identifying understaffing or overstaffing in the overall hospital and in measurable cost centers. Moreover, the LPC reports provide a reasonably accurate and continuous index of the degree to which hospital labor is being effectively utilized.
6. CASH consultants are sufficiently well trained in management engineering techniques and have sufficient experience to assist with diagnosing causes of overstaffing or understaffing and to make reasonable recommendations for resolving staffing problems.
7. In this experiment, CASH-IRE orientation of hospital staffs was not sufficient to ensure full understanding of the derivation and utility of the LPC program.
8. In this experiment, retrospective computation of base-year performance indexes (based on

unaudited data) contributed to false optimism or pessimism among experimental participants and unanticipated incentive "winners" or "losers."¹

Recommendations

1. An assessment should be made of the validity and reliability of the review and adjustment procedures applied to the 28-day (or one-month) control-period data to ensure that standards developed accurately reflect annual trends. When such trends are not accurately reflected, the standards should be revised accordingly.
2. An assessment should be made of the reliability and validity of the review and adjustment of control-period task mix data, particularly in departments doing, primarily, diagnostic and treatment procedures, e.g., laboratory and radiology departments. Revisions should be made accordingly.
3. Written guidelines should be prepared that define the review and adjustment procedures used for the control period to account for seasonal and occupancy trend patterns and for other unique characteristics of hospitals.
4. Uniform systems and procedures for monitoring accuracy of hospital ongoing data inputs should be developed, put in written form, and used. These systems and procedures should incorporate the use of an exception reporting system, with predefined tolerances for the acceptance of data without review.
5. Uniform systems and procedures should be developed and put in written form for reviewing the validity of the standards and the validity of their application.

Process

Conclusions

1. The CASH-defined essential that the hospital's chief executive officer fully understand the

LPC program and, more particularly, the derivation of work performance standards, was not achieved in all participating hospitals.

2. There was substantial misunderstanding of the derivation of work performance standards and substantial misinterpretation of LPC reports at the department head level.
3. There were some general differences in the extent to which direct patient care department, service department, and clerical department heads understood, were receptive to, perceived the utility of, and used the LPC program.
 - a. Physician department heads tended to have lesser degrees of understanding, receptivity, and so forth than did other department heads.
 - b. Nursing directors tended to understand the program but had low levels of receptivity, perceived utility, and actual use.
 - c. Heads of large nonpatient care — e.g., housekeeping and dietary — tended to be more positive on all counts.
 - d. Heads of clerical department — e.g., admitting, business office, and medical records — tended to vary, but were, generally, more positive than were physician and nurse department heads but less positive than heads of large nonpatient care departments.
4. There was a pervasive lack of understanding and a misunderstanding of the LPC program among hospital personnel below the department head level. This situation precluded the possibility of labor productivity improvement — prompted by use of the LPC program — emanating from this staff level.
5. Untimely submission of monthly work volume and manhours worked data, and the resulting delay of feedback on work performance, lessened the potential utility of the LPC program. (Some hospitals submitted data from three to six months late.)

Recommendations

1. Greater emphasis should be placed on: (1) orienting hospital staffs to the concepts underlying the LPC program, (2) ensuring that hospital staffs understand the program, and (3)

¹ The index used in the LPC program is based on the ratio of standard hours to hours worked, while the ratio reflected by the cost-savings computation is standard hours to hours paid. Discrepancies can arise and, in at least one case, led to a false sense of accomplishment in a hospital that, on the basis of the LPC-computed performance index, anticipated being a winner but was ultimately a loser as a result of a change in the hours worked to the hours paid ratio.

training hospital personnel in the use of the program.

2. Alternative mechanisms should be developed and tested for ensuring greater compliance with, and commitment to, active participation in the program. Consideration should be given to:

- a. Imposing negative sanctions (tied to incentives) for failure to comply with requirements for submitting data.
- b. Imposing negative sanctions (tied to incentives) for failure to take action in departments that perform at below a pre-specified level.
- c. Requiring that a labor productivity committee be appointed, having on it representatives from the governing body, the medical staff, the management staff and, if possible, the work force. The committee should be responsible for formulating policy, reviewing both compliance and level of participation, identifying targets for action, establishing goals, and determining extent and effect of accomplishments.
- d. Promoting a "management by objectives" type of program whereby hospital participants, at the CEO and department head level, in effect obligate themselves, contractually, to agree to the reasonable validity of measured performance and to the accomplishment of some level of improvement (where appropriate).

EXPERIMENTAL TECHNIQUES AND PROCEDURES

Sampling Technique

The conclusions and recommendations presented here have been derived from an analysis of the sampling technique used. This analysis is described and the results presented in a component evaluation report, Working Paper No. 1 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.

Conclusions

1. The original sample of 26 hospitals can be considered representative of those 26 hospitals only; findings cannot be statistically generalized.

- a. The sampling technique was improperly used. Moreover, it was an improper technique, in terms of the purpose and expected outcome of the experiment.
- b. Sample selection and resulting representativeness were biased.
- c. The characteristics used as the basis for selection were not totally appropriate for the experiment.
- d. The sample size was not adequate to permit generalizations.

Recommendations

1. Hospital sampling experts should be employed in any future projects in which representativeness of a population is required.
2. In addition to the common classificatory variables, representativeness of hospitals should be considered in terms of variables appropriate to the focus of the experiment.
3. Consideration should be given to selecting samples that are large enough to permit statistical analysis.

Incentive Payment Computations

The conclusions and recommendations presented here have been derived from definitive, evaluative analyses of incentive computation procedures. These analyses have been described and the results summarized in a component evaluation report, Working Paper No. 6 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.

Conclusions

1. Data validation methods and procedures do not ensure equity for experiment sponsors or participants.
 - a. Neither HSSC auditing procedures nor CASH data monitoring procedures were sufficient in scope or method to ensure that valid data were employed in incentive computations.
 - b. Inadequacies in data validation procedures and methods allowed for possible data manipulation by participants that could inflate incentive payments.

- c. Final review of CASH close-out computations by HSSC was not sufficient to detect errors.
2. Incentive computation methods neither detected all forms of labor cost savings nor directly related computed awards to cost savings.
 - a. Labor productivity improvements could have been accomplished and incentive payments computed without actual achievement of real cost savings.
 - b. Labor productivity improvements, accompanied by relatively larger increases in average hourly wages, resulted in larger incentive payments.
 - c. Incentive payment computation methods rewarded only labor productivity improvements and obscured other methods of achieving labor cost savings, such as reducing overtime or substituting a lesser paid person to perform comparable tasks.
 3. Selected features of incentive computation procedures negated labor cost savings and may have limited the motivational effect of incentive payments.
 - a. The 110 per cent chargeback feature can negate labor productivity improvement and related cost savings accomplishments, when such improvement may not, in fact, adversely affect quality of care.
 - b. Because incentive losses were carried forward from preceding years, computation of large losses in the first year of the experiment may have stifled motivation to improve labor productivity in subsequent incentive years.
 - c. The nonstandard accuracy of computations could have resulted in sizable variations in incentive gains (losses) and payments.
 - d. Untimely conduct of audits and reporting of incentive-year closeout results — nearly one year late in the first and second incentive years — may have diminished the motivational effect of the receipt of an incentive payment.
 - e. Lack of correspondence between the performance index computed by the LPC

program and the change in labor performance reflected by incentive computations may have produced a false sense of optimism that precluded motivation to further improve labor productivity.

4. Participants did not understand incentive computations sufficiently well to manipulate data submitted in order to enhance incentive payments.
5. Participants did not attempt to manipulate data to increase incentive payments.
6. The 110 per cent chargeback feature affected hospital winner or loser status and, in some cases, significantly reduced incentive payments.
7. Errors were made in computing incentive payments for the first incentive year; these errors were associated with improper handling of data that were not comparable for the base and first incentive years.

Recommendations

1. Auditing procedures should be expanded in scope to ensure that both inputs to incentive computations and the actual computations are valid.
2. All auditing validation of data used in computation procedures should be conducted by an independent third party (not CASH), in accord with sound and generally accepted accounting and auditing methods and procedures.
3. Experimental base and incentive years should conform to hospital fiscal years.
4. Insofar as is procedurally and temporally possible, audits should be tied to pre-existing fiscal intermediary or private audit functions.
5. Audit procedures should incorporate review of capital purchases to ensure that equipment acquisitions that might affect labor productivity are reported and accounted for.
6. Standardized accuracy (a mathematically appropriate and uniform number of decimal places) should be employed in incentive computations.
7. The automatic 110 per cent chargeback feature should be eliminated. Cost centers achieving

greater than 110 per cent performance indexes should be independently assessed and, if quality is found to be satisfactory and standards valid, such productivity should be rewarded.

8. Provision should be made to examine the cause of large incentive losses, and, if the cause is somehow beyond the control of the hospital or otherwise justifiable, losses should not be carried forward fully.
9. The index of labor productivity used for continuous monitoring of labor productivity should be the same as that used in incentive computations.
10. Alternative mechanisms should be considered for computing incentive awards that make provision for base-year performance index or for margin for improvement. Possibilities include:
 - a. An automatic award for performance index above a prespecified level, with adjustments for improvement or decline;
 - b. Awards determined on the basis of previous year's performance index, margin for improvement, and actual improvement; and
 - c. A requirement that a minimal performance level be achieved before awards are made.

Incentive Payments

The conclusions and recommendations presented here have been derived from an analysis of the case studies conducted and from a statistical analysis of data collected. These analyses have been described and the results summarized in Working Paper No. 7 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four, and in the case study reports, Part Three of the same publication.

Conclusions

1. Potential incentive payments were not perceived by hospitals as substantial enough to warrant consistent and concerted efforts to improve labor productivity.
2. The potential incentive payment lacked visibility and reality for experiment participants.
3. Receipt of payment did not generally motivate subsequent additional efforts to improve labor productivity.

4. Time lags between completion of incentive years and the receipt of incentive payments may have contributed to the payment's failure to motivate further improvement in labor productivity.
5. The lack of provision for sharing incentive payments with all or selected members of participating hospital staffs precluded a test of whether the offer of incentive payments to individuals is effective in the hospital.
6. A greater margin for improving performance index (or a lower previous year's performance index) was not associated either with productivity improvement or with magnitude of performance index improvement.
7. It is not possible to conclude whether experimental hospitals with initial high performance indexes would have performed better if some recognition or reward had been given for high base-year performance index.²

Recommendations

1. Provisions should be made to increase the visibility of incentive payments and to establish more clearly their relationship to labor productivity improvements.
2. Incentive payments should be made on a more timely basis.
3. Experiment sponsors should design methods by which hospitals could equitably distribute incentive awards to hospital employees and should encourage this practice.

OVERALL RESULTS

Effect on Quality of Care Provided

The conclusions and recommendations presented here have been derived from findings of the case studies, previously cited.

Conclusions

1. Labor productivity improvements were frequently perceived by staff as being achieved at the expense of quality of service or care.

² Since a hospital's net incentive gain or loss is multiplied by the previous year's performance index, as one step in computing incentive payments, the hospital with a higher previous-year performance index does receive a proportionately greater award.

2. There was no significant or consistent evidence that labor productivity improvements were accomplished at the expense of quality of service or care.
3. The 110 per cent performance index level did not appear to be a threshold above which quality of service or care began to deteriorate.

Recommendations

1. Methods should be established for assessing patient satisfaction as one approach to evaluating the relative level of quality.
2. New methods of assessing quality should be carefully examined and, where appropriate, should be included in future designs.

Extra-organizational Influencing Factors

The conclusions and recommendations presented here have been derived from findings of the case studies previously cited.

Conclusions

1. Critical events in the natural history of the experimental hospitals had, in some cases, a more significant influence on experimental outcomes than did the offer of a financial incentive or the use or lack of use of the LPC program.³
 - a. Planning and carrying on major construction or renovation projects detracted from labor productivity improvement efforts by diverting the energies of management staff and other staff members from hospital operations to these additional activities. Such projects also impeded routine operations.
 - b. The expansion of the facility or the addition of beds and services contributed to labor productivity decline, because it was often necessary to have old and new services operating in parallel for some period of time. At such times, staffing may have exceeded the initial demand for service, or the minimal staffing required for

³ CASH representatives, on their own initiative or when they were requested to do so, sought to make proper adjustments for these factors. It was suggested during case study interviews that not all of these events were brought to their attention, nor did they, in all cases, have time to do the exhaustive reviews necessary for standards adjustments.

operations — required but without sufficient demand for efficiency — may be reflected in a low performance index.

- c. The Economic Stabilization Program (ESP) imposed in the middle of the second incentive year precluded further cost savings attempts (including attempts at further improved labor productivity) in at least one hospital because of limitations on revenues in excess of expenses.
- d. Attention to remaining within ESP guidelines may have diverted energies that might otherwise have been focused on improving labor productivity and on related cost savings.
- e. Efforts of county hospitals to change their image, from that of hospitals of last resort for the poor to that of a community hospital, contributed to declines in labor productivity in these institutions. These efforts, which coincided with the experimental period, included improved staffing ratios.

Recommendations

1. Systematic identification should be sought of extra-organizational factors that may influence experimental outcomes and, where appropriate, such factors should be accounted for by proper adjustments.
2. Provisions should be made so that hospitals do not lose motivation and are not penalized as a result of extra-organizational factors that adversely affect experimental outcomes and are deemed beyond the control of the hospital staff.

Intra-organizational Influencing Factors

The conclusions and recommendations presented here have been derived from findings of the case studies previously cited.

Conclusions

1. The presence of organizational cost consciousness prior to the onset of the experiment — or its attainment during the experiment — was the factor most highly correlated with improvement in labor productivity.
2. Hospital staff members dismissed unfavorable

LPC reports when alternative indicators, such as a budget or Hospital Administrative Services (HAS) reports, showed that the hospital was performing adequately.

3. The attitudes, values, perceived security, and management styles of hospital CEOs were among the most significant factors influencing experimental outcome.

a. A broad array of management styles was represented by participating CEOs; however, the coercive or autocratic approach appeared to be among the most effective in achieving desired CASH-IRE objectives.

b. Unless CEOs were previously cost conscious, they did not change attitudes or exhibit new or different behaviors as a result of their participation in IRE.

c. CEOs were very much aware of their vulnerability and determined to "steer clear" of or "tread lightly" in areas in which threatening conflicts were likely to emerge.

d. A CEO generally would not promote or take action that might significantly depart from general trends of growth, expansion, or staff increases or otherwise depart from the "status quo" unless he had support and urging from either the governing body or the medical staff or, usually, from both.

4. CEOs used different approaches to assessing and using the LPC program in different departments.

a. CEOs devoted relatively little attention to departments with physician heads and were seemingly unwilling to impose labor productivity improvement measures on these departments.

b. While CEOs closely scrutinized labor productivity in nursing departments and encouraged improvements, they rarely imposed improvement measures on them.

c. CEOs most vigorously pursued improvement in labor productivity in the large, nonmedical care areas, such as the house-keeping and dietary departments.

d. Generalized conclusions regarding CEO pursuit of labor productivity improvements

in "clerical departments" (such as admitting) are not possible.

5. The generally expressed beliefs among CEOs that labor productivity and cost effectiveness of hospitals could be improved through effective application of industrial engineering techniques is undoubtedly a major factor precipitating development and support of CASH-IRE. However, this belief was generally not sufficient to prompt taking action.

6. Support by the CEO was a necessary, but not sufficient, condition for achieving labor productivity improvements.

7. Direct and persistent follow-up by the CEO or his administrative designee was associated with effective application of the LPC program and with related productivity improvements.

8. CEOs effectively used the LPC program in various ways:

a. The LPC program was characterized as a government-imposed program that required labor productivity improvement.

b. The LPC program was used as a supplement to ongoing efforts to contain operating expenses.

c. The LPC program was used selectively to corroborate intuitive feelings regarding overstaffing and as leverage for refusing requests for additional personnel.

9. Department heads varied widely in attitudes, values, and cost consciousness and in levels of understanding of the LPC program and the derivation of its performance standards. This variation affected the extent to which labor productivity improvements were attempted and achieved.

a. Low levels of awareness and understanding of the LPC program among physician department heads, together with their belief that management engineering techniques were useless, resulted in these physicians' failure to use the LPC program.

b. Department heads were primarily concerned with day-to-day operations and with minimizing problems and conflicts; labor productivity was generally of secondary interest.

- c. Heads of departments with low performance indexes generally did not accept the figures as reflecting their departments' efficiency and rationalized their position by criticizing labor performance standards.
 - d. The majority of the department heads interviewed in the case studies neither understood the derivation of work performance standards nor appreciated the potential utility of the LPC program and the services of the CASH representative.
 - e. Department heads (particularly heads of direct patient care departments) tended to perceive improved labor productivity as an alternative to a high quality of service or medical care.
10. A few department heads exhibited characteristics that were contrary to those just described. These department heads also exhibited relatively strong orientations to labor productivity and cost effectiveness and had developed their own labor resource allocation systems — ones they considered more useful than, and superior to, the LPC program. These department heads considered the performance index as verification of accomplishments made independently of the LPC program but pointed to the limitations of that program and to its lack of utility relative to that of their own system.
11. While department heads in general stated that labor productivity could be improved and that industrial engineering techniques and the LPC program could assist with improvement, the department heads who used the program were the exception.
12. Heads of the direct patient care departments (particularly physicians) expressed the opinion

that only professional colleagues — physicians or, perhaps, trained technicians — could make valid observations and recommendations for improving work methods, labor productivity, or department operations. In general, this belief limited receptivity to, and use of, the LPC program in these departments.

Recommendations

1. Chief executive officers should be required to assume coordinating responsibility for the LPC program or to appoint a suitable coordinator for it.
2. Greater emphasis should be placed on: (1) orienting hospital staffs to the concepts underlying the LPC program, (2) ensuring that hospital staffs understand the program, and (3) training staffs in the use of the program.

Statistical Relationships

Conclusions and recommendations presented here are derived from the quantitative analyses reported in Working Paper No. 7 in *Incentive Reimbursement: Evaluation of an Experiment*, Part Four.

Conclusions

1. With respect to the effective utilization of a labor performance control program, the optimal size of a hospital appears to be 251 to 400 beds.
2. Relative improvement in labor productivity is more likely in hospitals with high occupancy and turnover rates.
3. Some hospitals may require more than three years before their management staffs can effectively utilize a labor performance control program.

Having reported the findings and conclusions drawn from this evaluation and having presented a set of recommendations, the evaluators are compelled to add this brief commentary, consisting of a blend of theory, discussion, and speculation. The compulsion derives from the seemingly persistent tendency among designers, sponsors, and supporters of institutional incentive plans to underestimate the inherent resistance to change in individuals and in organizations and to overestimate the motivating power of financial institutional incentives. Comments are presented here in three major categories; (1) resistance to organizational change, (2) institutional financial incentives, (3) the hospital organization's interest in change and capacity to change.

ORGANIZATIONAL CHANGE

Resistance to Change

Clearly, the intent of incentive reimbursement plans is to promote change. While the desired change may be expressed in organizational terms, it cannot be forgotten that it is the individual worker who must alter his or her behavior if the desired change is to be accomplished. During the last several decades, social scientists have examined behavior and, more particularly, human behavior in organizations. In the relatively rich body of knowledge in this area, there is repeated evidence that individuals possess certain personality or psychological characteristics that prompt resistance to change that is externally introduced and not clearly in accord with previously valued desires. In addition to these characteristics, there are forces observable in groups or social systems that, similarly and additively, cause resistance to change. On the basis of Watson's framework,¹ the following paragraphs describe some of these forces and present examples of ways in which they were manifested in the conduct of CASH-IRE.

Psychological Forces

Among the more familiar personality characteristics or psychological forces that prompt resistance to change are habit and primacy. It may be observed that lower organisms, as well as humans, respond in their accustomed way of doing something, unless the environment or situation changes

noticeably. Moreover, once a habit is established, it may become intrinsically satisfying. Somewhat related to habit is the notion of primacy: the way in which an individual first copes, successfully, with a situation sets a pattern that may be observed to persist. While it was not possible to observe the impact of these forces during the experiment, it is reasonable to expect that, because labor productivity improvement requires changing habits and patterns, such improvement would be resisted by individuals required to change. Moreover, change might be accomplished only if sufficient counter forces (positive or negative) were applied.

Selective perception and retention are also observable and demonstrable psychological phenomena. These phenomena relate to the fact that an individual responds to information or to suggestions within the framework of his established outlook. In practice, individuals tend to perceive and retain that with which they agree and, conversely, to resist or reject that with which they disagree. These phenomena manifest themselves in the misunderstanding of communications that, if understood, would be dissonant with pre-established attitudes and in the forgetting of learning that produces dissonance.

The experimental case studies provided evidence of selective perception and retention. Performance standards established during the experiment were understood and accepted to a much greater extent among staffs of well-performing hospitals or departments; staffs in low-performing hospitals or departments showed a greater propensity to misunderstand or reject the standards. The latter group of individuals did not perceive their operations as inefficient and, to avoid the dissonance-producing evidence of the LPC reports, they rejected the evidence or conveniently forgot that it had any legitimate basis.

Freud's concept of the superego also explains resistance to change. From infancy through the childhood socializing process, individuals internalize a code of controls regarding proper and acceptable behavior. Typically, the child's superego and his behavior patterns correspond to those of his parents and are not based on rational conclusions drawn from experience. Thus, the superego is a powerful force in maintaining tradition. The superego may be an even more potent force in the resistance to change among professionals than

¹ Watson, Goodwin. *Resistance to Change*. In *The Planning of Change*, 2nd Edition. New York: Holt, Rinehart, and Winston, Inc., 1969, pp. 488-498.

among members of the larger work force. In this regard, Watson says: "The [professionals] take pride in making service demands on themselves and others. They bitterly resist any change which they conceive to be a relaxation of the firmest discipline and the highest expectations of perfection of performance."²

Self-distrust is another personality characteristic that contributes to an individual's tendency to resist change. Self-distrust is fostered by the superego and by dependence, another phenomenon of early childhood. Because they are dependent, infants and children tend to incorporate the values, attitudes, and beliefs of those who care for them, and these attitudes, values, and beliefs tend to prevail into and through adulthood. As a consequence of dependence and of the superego, individuals tend to distrust or resist impulses (to change) that are contrary to established routines or standards. It was, perhaps, self-distrust that produced resistance to impulses to value and use the LPC program, which would have changed routines or standards of performance.

Insecurity and regression are also observable psychological phenomena in individuals. It might be expected that, when the old ways of doing things (staffing) no longer produced the desired outcome, it would be logical to experiment with something new. However, it has been observed that the prospect of change arouses anxiety and that, as a result, individuals may cling even more desperately to the old. Heads of departments with low performance indexes were, perhaps, exhibiting this phenomenon when they voiced their dissatisfaction with the questioning of their wisdom in staffing practices, saying that they had always been concerned with efficiency, when, in fact, they had rejected recommendations made by the CASH representative.

Social Forces

In groups, norms or expected ways of behaving correspond to habits in individuals. Norms make it possible for members of a group to work together — each knows what to expect from the other. It may be observed that members of groups demand of themselves and of other members conformity to established norms. Because these norms are shared, they are not easily changed. Evidence from industry has shown repeatedly that acceptable work performance levels are established as norms by work groups, and efforts aimed at gaining increased

productivity will invariably meet with resistance. While work groups in the experimental hospitals were not observed, experience in industry is sufficient to permit the assumption that real or expected resistance to change in productivity norms contributed to the general lack of observed, concerted efforts among management staffs of experimental hospitals to improve labor productivity.

Systematic and cultural coherence is another social force contributing to resistance to change. Watson states: "The Gestalt principle that parts take on characteristics because of their relationship within the whole implies that it is difficult to change one part without affecting others."³

Typically, this systems concept is applied to ensure that beneficial change made in one part of a system does not adversely affect another part or does not produce a net negative effect for the larger system. Generally, there was no evidence in CASH-IRE that labor productivity improvements made in one area in any way adversely affected other operating areas. However, it is possible that the strong resistance to change observed, particularly in the direct patient care departments, increased the resistance in other departments.

Resistance to change is generally most apparent when it threatens the economic or prestige interests of individuals or groups. Certainly, CASH-IRE may have been perceived as threatening the vested interests of individuals and work groups in experimental hospitals. A low departmental performance index is clearly threatening to a department head who perceives himself as an effective manager. Another example of how the experiment threatened vested interests is evidenced in the responses of several physician department heads. In this example, the vested interest is freedom to operate as one pleases. Several of these physicians did not understand the program but stated that only an individual technically trained in the department's activities could recommend useful operating or staffing changes.

Some attitudes, values, and behaviors are more easily changed than others. Anthropological studies indicate that beliefs or behaviors relating to matters considered sacrosanct cause the greatest resistance to change. Attempts to reform that have an impact on taboos or rituals produce the most vivid evidence of this phenomenon; attempts at change that enter the realm of ethics or morals produce

² Ibid., p. 492.

³ Ibid., p. 494.

similar resistance. While it is difficult to assess the extent to which this phenomenon was operative in producing resistance to the desired changes of CASH-IRE, it is reasonable to suggest that interpersonal and role relationships — doctor-patient, nurse-doctor, nurse-patient, and, perhaps, others — are considered more in the realm of the sacrosanct than are relationships in most other organizational settings. In this light, the real or perceived threat that improved labor productivity might somehow alter these relationships may have contributed to the limited change achievements of the experiment.

It is also noted that change introduced by an outsider to a social system invariably generates hostility, suspicion, and resistance. This phenomenon, which is evident in animal behavior, is clearly illustrated in the combination of curiosity and antagonism generated by a foreigner entering a new culture or country. Watson says: "A typical attack on any new proposal is that it doesn't fit our local conditions."⁴ The response of several of the persons interviewed regarding the labor performance standards of the LPC program can be stated by merely altering and adding a few words to this quote.

Finally, there is a societal value that undoubtedly made a very significant contribution to the resistance, in the experimental hospitals, to undertaking the desired change. Growth and expansion in this country are more than just trends, they represent an ethic that, in large measure, has contributed to this country's place as a world power. The hospital industry and the individual hospitals have adopted this ethic, which has contributed to over-bedding and duplication of services in many areas. Moreover, one cannot help but suspect that this phenomenon contributed to the lack of success of this incentive reimbursement experiment and others. Growth and expansion are equated with success, and the notion of reducing or containing resource consumption is clearly contrary to this ethic. Catapulted by the explosion of medical technology, the hospital industry, its administrators, department heads, and other staff members have become accustomed to new beds, new services, and added personnel. It may be expected that hospitals and hospital staffs resist demands of consumers, third parties, or programs of third parties that promote or encourage forces that oppose this growth.

It has become clear in this evaluation that adequate consideration was not given, in the experimental

design, to the psychological and social forces operative when organizational change is attempted.

INSTITUTIONAL FINANCIAL INCENTIVES

As stated earlier, there seems to be a consistent and persistent propensity among the designers and sponsors of financial incentive plans for hospitals (including this one) to overestimate the motivating power of the offer of a financial institutional incentive. In the institutional incentive concept, there seems to be an implicit assumption that, like the hungry donkey which pursues the carrot on the stick or the worker who has not met his basic economic needs and produces more for additional compensation, the hospital will improve its organizational performance if a financial incentive is offered.

The institutional incentive concept, for all intents and purposes, ignores the fact that it is the individual workers who must change their behavior if the desired organizational change is to be achieved. Somewhere in the reasoning of the designers of institutional incentive plans is the assumption that the hospital is a rational, economic organization that values financial rewards, that is capable of responding to the incentive offered, and that will respond in the desired manner.

It is in attempting to link the experimental objectives, the reward plan, and the process of change that the design of CASH-IRE — and that of other institutional incentive plans — seems to ignore the logic of change theory and behavior modification through positive reinforcement. With the possible exception of some government contracts — particularly Department of Defense contracts — the notion of institutional incentives seems to be limited to the hospital industry and its system of third-party payers.

The vast majority of experiences with incentive plans has been in industry, where the individuals who are required to change their behavior are rewarded directly. In these situations, the issues considered relate, invariably, to how large a reward must be offered, how can it be paid on a timely basis so that the worker will link the reward with his behavior change, at what point or level of total compensation the worker is no longer motivated by financial incentives, and to what other forms of recognition will the worker respond.

These matters related to rewarding individuals were not at issue in CASH-IRE or in any of the other

⁴ Ibid., p. 496.

institutional incentive plans developed in the hospital field. No provision was made in experimental designs for rewarding individuals, nor did participating hospitals make provision for sharing incentive payments with workers whose behavior modification was required to produce the desired result. CASH-IRE, as have previous institutional incentive projects, violated a basic principle of incentive or reward theory: "Any incentive plan should offer rewards or penalties to those people who are in positions to bring about the kinds of changes in performance that the sponsor wants to encourage."⁵

Statistical analyses conducted in this CASH-IRE evaluation project produced no evidence that the offer of a financial incentive induced improved labor productivity in the experimental hospitals. Rather, the statistical analyses, together with the findings from the case studies, strongly suggest that labor productivity improvements were made where cost-effective operations seemed to be an organizational priority. Even in these situations, however, hospital staff members interviewed stated that the institutional incentive offered no additional, significant impetus for achieving the organizational goal.

If one reviews the literature on behavior modification and organizational change, one is not surprised to find that the institutional incentive did not accomplish its purpose. There is no evidence, in fact, to suggest that behavior can be changed and the desired organizational performance accomplished by the offer of a reward that means little or nothing to the individuals who must change their behavior.

ORGANIZATIONAL READINESS AND CAPACITY TO CHANGE

One of the more worthwhile insights gained by the conduct of CASH-IRE and its evaluation pertains to perceived interest, readiness, and capacity of hospital management staffs to undertake the task of improving cost effectiveness — whether that improvement be through improved labor productivity or through other approaches. Chief executive officers in the experimental hospitals chosen for case studies all agreed that operating costs in the hospital industry and in their own hospitals could be reduced. Moreover, they agreed that manage-

ment engineering techniques could be used to accomplish improved cost effectiveness.

Despite the expression of these beliefs, the majority of the chief executive officers made no concerted effort to improve productivity, even though their LPC reports indicated improvements could be made and even though the CEOs had available to them the services of trained management engineers. While agreement among department heads was not as widespread as that among CEOs, department heads generally expressed beliefs similar to those of the chief executive officers. Even so, with the same evidence of possible improvement and with the same expertise available to them, department heads who initiated action were rare exceptions.

These somewhat incongruent findings are, at best, difficult to assess. It may well be, however, that perceived room for improvement does not go hand-in-hand with efforts to make that improvement. It may also be that real or perceived resistance to change is so great that top-level and mid-level managers are unwilling to confront this resistance, to take the steps necessary to make improvements, and to deal with the conflicts that might arise. Another possible explanation is that a cost-effective operation is a low-priority consideration — one that is subordinate to delivering high quality care or to operating with a minimum of conflict. Finally, it is also possible that these managers do not have the competence to achieve what they believe to be necessary change. The extent to which these explanations apply undoubtedly varies in presence and degree from hospital to hospital and from manager to manager.

While the comments that follow enter the realm of speculation, it seems important that some attempt be made to discuss briefly some impressions of the participating hospital managers, vis-à-vis cost-effective operations. At a time when hospital costs have become a focal point of concern in our inflationary economy, some hospital CEOs seemed highly resistant to becoming concerned enough about cost-effective operations to take appropriate action. Among these CEOs, cost effectiveness would appear to be subordinate to more traditional concerns of operating a prestigious, if not fully occupied, hospital. The name of the game in this tradition is providing the best equipment, the best facilities, and the best hospital and medical staffs. And, all too often, the best is operationally evidenced by the most. Obviously, this is a tradition that countervails striving for cost-effective hospital operations.

⁵ Densen, P. and Bauer, K. *Some Issues in the Incentive Reimbursement Approach to Cost Containment: An Overview*, Health Care Policy Discussion Paper, No. 7. Boston: Harvard Center for Community Health and Medical Care, May 1973, p. 34.

Other CEOs seemed to value cost effectiveness more highly but seemed unwilling to confront real or perceived conflict that might arise if they were to press for cost effectiveness. The hospital administrator functions in an organization with multiple lines of authority. The most successful CEO in an experimental hospital stated that he could not have accomplished what he did without the full support of two other sources of authority — the governing body and the medical staff. While hospital CEOs may have, in recent years, gained some power relative to these two other power sources, it appears that, without their support, many CEOs will continue to be reluctant to take the steps necessary to reduce or contain operating costs. Once cost-effective operations become a responsibility accepted and shared by these three major power sources, change may be more readily accomplished.

A major problem in achieving more cost-effective operations in hospitals — whether cost effectiveness be promoted by the hospital itself or by some third party through positive or negative sanctions — is the managerial competence of department heads. While there were many exceptions, the general impression gained from interviewing department heads was that these individuals displayed little orientation toward their roles as managers and that they projected a general lack of managerial competence.

There has been a tendency in the hospital industry to promote the technically competent worker to supervisor and the technically competent supervisor to manager or department head. This tendency may be the reason for the perceived lack of management competence among these individuals. On the other hand, the reason may be their lack of management training, or it may be a combination of both, together with still other factors. Regardless of the reasons, there remains a lingering concern among those who interviewed these individuals that some of them will never have the competence to employ a relatively simple tool like the LPC program and most will require considerable management training before they can successfully initiate cost-effective change. Without this orientation and competence, cost-effective change must be accomplished by top-level management edict, which could bring dysfunctional consequences.

The managerially oriented, cost-conscious department head can be effective in this area. Interviews with several unusual department heads provide the basis for this statement. These highly motivated,

managerially oriented individuals perceived cost-effective operations as among their major management responsibilities. Accordingly, they developed their own systems of controlling and optimizing the use of resources, including labor resources. Their departments, not coincidentally, registered high and improving performance indexes throughout the experiment.

Thus, mid-level management's competence and orientation to cost-effective operations are necessary if cost-effective change is to be accomplished with minimal risk of adverse consequences. These observations also suggest that the desired change can emanate from other than top-level management if mid-level managers have the necessary orientation and skills.

SUMMARY

Resistance to change, the efficacy of financial institutional incentives, and the managerial readiness and capacity to accomplish change have been recurring themes in the evaluation or discussion of hospital incentive reimbursement plans:

"None of these [incentive reimbursement experiments] have gone far enough into the gut questions of what makes a hospital tick, how you build concern for efficiency and economy into a professionally-oriented, non-profit institution, how you relate payment for services to institution goals and management performance, how you get response management in a dual control situation."⁶

"It is essential to remember the strength of the countervailing incentive. The prestige of a hospital does not stem from its ability to operate with the highest economy, but from its reputation as a source of effective medical care derived from a good medical staff and modern, up-to-date facilities. . . . We delude ourselves if we think that essential priorities are going to be changed by the offering of some financial reward that is insignificant in size, two years late in coming, and rarely directed to the people in the institution who are making cost consequential decisions."⁷

"As conceived by some economists, the notion of institutional financial incentives — as contrasted with individual incentives — reflects an overestimation of the strength of hospital internal or-

⁶ Somers, A.R. Hospital Costs and Payment: Suggestions for Stabilizing the Uneasy Balance. *Medical Care* 7: 348-60, Sept.-Oct. 1969, p. 359.

⁷ Densen and Bauer, op. cit., p. 31.

ganization and corporate decision-making, or a level of abstraction about statistical relationships that has precious little practical meaning.”⁸

Regrettably, it would seem, the evaluators and observers of hospital organizational change endeavors pay more attention to these considerations than do the designers and sponsors of the various plans that have been tried. Perhaps this one additional admonition will initiate greater concern and encourage sponsors and designers to consider the findings of this evaluation and others and, particularly, to consider the growing body of

theory on organizational change in future plans for promoting cost effectiveness in hospitals.

If, at this point, the reader-taxpayer is bemoaning this perhaps unwise expenditure of his tax dollar, it is important to re-emphasize that the worthwhileness of any endeavor depends on the criteria used to evaluate it. If this incentive reimbursement experiment and others seem to repeat many of the same errors of design and if they cannot be characterized as successes, they may be viewed as worthwhile if they preclude implementation of such plans on a nationwide basis. Moreover, they can be considered worthwhile if they eventually contribute to the development of related or alternative approaches which actually accomplish the goal of greater cost effectiveness in hospitals.

⁸ Sigmond, R.M. The Notion of Hospital Incentives. *Hospital Progress* 50:63-68 Jan. 1969, p. 64.

APPENDIX A. CASE STUDY INTERVIEW SCHEDULE

CHIEF EXECUTIVE OFFICER

Interviewer: _____

Interview date: _____

I. IDENTIFICATION

A. Hospital name: _____

B. Chief Executive Officer (CEO): _____

1. CEO start date: _____

2. Tenure of former CEO: _____

C. CASH member ☐ Yes ☐ No

1. If Yes, please identify departments which participated in the CASH Program prior to the CASH-IRE; also dates and activity status: (1=Very Active, 2=Active, 3=Inactive).

<u>Department</u>	<u>Date</u>	<u>Status</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

D. Since the beginning of the CASH-IRE have any changes taken place which affected hospital operations (include impact on productivity index)? More specifically changes such as:

☐ Yes ☐ No. 1. Construction and/or Renovation — Comments: _____

☐ Yes ☐ No. 2. Ownership — Comments: _____

☐ Yes ☐ No. 3. Occupancy — Comments: _____

☐ Yes ☐ No. 4. Labor Relations — Comments: _____

☐ Yes ☐ No. 5. Scope of Services — Comments: _____

☐ Yes ☐ No. 6. Equipment — Comments: _____

☐ Yes ☐ No. 7. Medical Staff Organization — Comments: _____

☐ Yes ☐ No. 8. Key Personnel — Comments: _____

☐ Yes ☐ No. 9. Other: _____ Comments: _____

☐ Yes ☐ No. 10. Other: _____ Comments: _____

II. ADMINISTRATION ATTITUDES

- A. We are interested in your perception of the reasonableness of hospital operating costs. Please indicate your perception of costs in the hospital industry generally and your hospital specifically by selecting from the following statements the one that best describes your feelings: (Check one)

Hospital costs are:	Hospital Industry	Your Hospital
1. less than what they should be	_____	_____
2. about what they should be	_____	_____
3. higher than what they should be	_____	_____

Comments (qualify or justify): _____

- B. Please indicate your perception of the adequacy of the level of efficiency, again, in both the hospital industry and your hospital by selecting from the following statements:

The level of efficiency in hospitals is:	Hospital Industry	Your Hospital
1. less than adequate	_____	_____
2. about adequate	_____	_____
3. more than adequate	_____	_____

Comments: _____

- C. Please select the statement which best describes your opinion of the effect effective application of *industrial engineering methods*, e.g., time motion studies, work distribution, job simplification would have on *operating costs* in the hospital industry, your hospital (Check one):

	Hospital Industry	Your Hospital
1. increase operating costs	_____	_____
2. have little or no effect on operating costs	_____	_____
3. decrease operating costs	_____	_____
4. significantly decrease operating costs	_____	_____

Comments: _____

- D. Are you familiar with the CASH Labor Performance Control (LPC) Program? ☐ Yes ☐ No. If Yes, select the statement which best describes your opinion of the effect the effective application of the CASH Labor Performance Control Program would have on *operating costs* in the hospital industry, your hospital (Check one):

	Hospital Industry	Your Hospital
1. increase operating costs	_____	_____
2. has little or no effect on operating costs	_____	_____
3. decrease operating costs	_____	_____
4. significantly decrease operating costs	_____	_____

Comments: _____

- E. We are interested in your perception of the motivational effect of the financial incentive of the CASH-IRE on your hospital and on other participating hospitals. Please indicate your perceptions by completing the following sentence with the phrase most congruent with your feelings. A hospital's motivation to improve its Performance Index under the CASH-IRE is (Check one):

	Other Hospitals	Your Hospital
1. not affected by the financial incentive	_____	_____
2. slightly affected by the financial incentive	_____	_____
3. moderately affected by the financial incentive	_____	_____
4. very much affected by the financial incentive	_____	_____

Comments: _____

III. CASH-IRE ORGANIZATION AND OPERATION

- A. In your hospital with whom does ultimate administrative responsibility for the CASH-IRE Program rest?

1. Title: _____
2. Estimate the average amount of time spent _____ %
3. Please describe activities associated with the CASH-IRE _____
 - a. Introduction of the CASH-IRE: _____

 - b. Management Staff Orientation: _____

 - c. Medical Staff Orientation: _____

 - d. Specific Programs Developed (Periodic Meetings, Goal Development, etc.): _____

 - e. Follow-up Programs: _____

 - f. Phase II Program Development: _____

 - g. Conflicts and Resolution: _____

B. In your hospital with whom does primary line (day to day) responsibility for the CASH-IRE rest?

1. a. Title: _____
 b. Estimate the average amount of time spent _____ %
 c. Responsibilities (Departments, Activities): _____

2. a. Title: _____
 b. Estimate the average amount of time spent _____ %
 c. Responsibilities (Departments, Activities): _____

3. a. Title: _____
 b. Estimate the average amount of time spent _____ %
 c. Responsibilities (Departments, Activities): _____

(Select one or more for interview)

C. Now I would like you to rate each of several departments on a number of dimensions. Using the first incentive year of the CASH-IRE as a time frame, please rate each department on each dimension using a five point scale where one is very poor, three is average and five is excellent:

Scale:

1 2 3 4 5
 | | | | |
 Very Poor Poor Average Good Excellent

	Management Effectiveness	Receptivity to Innovation	Receptivity to CASH-IRE Program	Quality of CASH Phase II Plan	Follow-through on CASH-IRE Program	Accuracy of CASH Standards

Comments: _____

- D. Now, I am interested in your explanation of the change in performance of the departments you just rated during the first incentive year of the CASH-IRE as reported in LPC Program terms of actual hours, standard hours, and performance index.

1. _____ Department	<u>Base Year</u>	<u>Incentive Year</u>	<u>Variance</u>
Actual hours			
Standard hours			
Annual Volume			
Performance Index			

Explanation: _____

2. _____ Department	<u>Base Year</u>	<u>Incentive Year</u>	<u>Variance</u>
Actual hours			
Standard hours			
Annual Volume			
Performance Index			

Explanation: _____

3. _____ Department	<u>Base Year</u>	<u>Incentive Year</u>	<u>Variance</u>
Actual hours			
Standard hours			
Annual Volume			
Performance Index			

Explanation: _____

4. _____	Department	<u>Base Year</u>	<u>Incentive Year</u>	<u>Variance</u>
	Actual hours			
	Standard hours			
	Annual Volume			
	Performance Index			

Explanation: _____

5. _____	Department	<u>Base Year</u>	<u>Incentive Year</u>	<u>Variance</u>
	Actual hours			
	Standard hours			
	Annual Volume			
	Performance Index			

Explanation: _____

E. Have you observed positive or negative changes in efficiency, effectiveness, or quality of service in other hospital departments since the beginning of the CASH-IRE? ☐ Yes ☐ No. If Yes, identify department, type of change, direction of change, and perceived explanation for change:

1. _____ Department, Explanation: _____

2. _____ Department, Explanation: _____

3. _____ Department, Explanation: _____

4. _____ Department, Explanation: _____

5. _____ Department, Explanation: _____

- F. I am interested in your explanation of the factors which most contributed to your hospital's overall improvement (decline) in Performance Index during the first incentive year. I have identified a number of possible factors and I would appreciate your commenting on their contribution as well as identifying others:

Improvement Factors

☐ Yes ☐ No Hospital wide hiring freeze — Comments: _____

☐ Yes ☐ No Hospital wide attrition program — Comments: _____

☐ Yes ☐ No Cost center effort to improve P.I. — Comments: _____

☐ Yes ☐ No Demand (occupancy) increase — Comments: _____

☐ Yes ☐ No CASH recommendations — Comments: _____

☐ Yes ☐ No Scheduling change — Comments: _____

☐ Yes ☐ No Other _____ — Comments: _____

☐ Yes ☐ No Other _____ — Comments: _____

Decline Factors

☐ Yes ☐ No Demand decrease (occupancy) — Comments: _____

☐ Yes ☐ No Unwarranted staff increase — Comments: _____

☐ Yes ☐ No Inadequacy of standards — Comments: _____

☐ Yes ☐ No Expansion program — Comments: _____

☐ Yes ☐ No Hospital staff resistance to change — Comments: _____

☐ Yes ☐ No Other _____ — Comments: _____

☐ Yes ☐ No Other _____ — Comments: _____

G. Have you earned an incentive payment for the first incentive year? ☐ Yes ☐ No. If yes, date: _____
_____. How did you or how are you planning to use the incentive payment? _____

Why? _____

H. Does the CASH Labor Performance Control Program have some value beyond offering a potential financial reimbursement? ☐ Yes ☐ No. If Yes, describe: _____

APPENDIX B. OVERVIEW OF INCENTIVES OF HOSPITAL COST CONTAINMENT: THEORY, PRACTICE AND PROSPECTS

As noted elsewhere, findings of the literature review conducted as part of the overall evaluation project have been published as a separate report. This report was designed to assist persons planning future incentive programs by presenting selected information on both theory and current practice of these programs and by outlining basic considerations that should be an integral part of the design, implementation, and operation of any future effort to motivate change in hospital performance.

Inasmuch as the findings of this review have not been specifically incorporated in the text of this general summary, its content is outlined here for the convenience of the reader.

The content of the report, which is Part Two of *Incentive Reimbursement; Evaluation of an Experiment*, is presented in five sections: (1) incentive programs — concepts and types, (2) a description of incentive programs in hospitals, (3) organizational change, (4) the hospital organization, and (5) suggestions for designing and implementing incentive programs in hospitals. In addition, there is a selected bibliography, which also is included at the end of this appendix.

The first section, on concepts and types of incentive programs, discusses the use of financial incentive payments for changes in performance and the various approaches that can be utilized when an attempt is made to use incentives as a mechanism for accomplishing change.

The second section, a description of experience with incentive programs in hospitals, summarizes the designs and reported results of both employee wage-incentive programs and institutional incentive programs. The information is based on articles published in the hospital literature, rather than on firsthand observation. Since this section is not an exhaustive review of all hospital-based incentive programs, there may be other programs that utilized different types of incentive approaches and that were more or less successful than those cited.

The third section, on organizational change, reviews the major management theories on the nature of organizational change and the methods for achieving organizational change.

The fourth section, on the hospital organization, notes the several unique characteristics of the hospital that significantly differentiate it from the product-producing, profit-maximizing corporate institution and, to a lesser extent, from other for-profit or not-for-profit service institutions discussed in the management literature on organizational change. This section provides a framework for understanding the complex nature of the hospital organization and identifies some of the difficulties that may be encountered when an attempt is made to accomplish change in the hospital.

The fifth section, which gives suggestions for designing and implementing incentive plans in hospitals, presents the general characteristics of successful incentive programs, as identified by various investigators. These investigators have reviewed the experiences of hospitals that have implemented their own incentive programs or have participated in incentive programs sponsored by third-party payers.

SELECTED BIBLIOGRAPHY

BOOKS

Bauer, K. *Containing Costs of Health Services Through Incentive Reimbursement*. Boston: Harvard Center for Community Health and Medical Care, December 1973.

Bennis, W.G., Benne, K.D. and Chin, R. (eds.) *The Planning of Change*. New York: Holt, Rinehart, and Winston, Inc., 1969.

Berki, S.E. *Hospital Economics*. Lexington, Mass.: D.C. Heath Company, 1972.

Coe, R.M. (ed.) *Planned Change in the Hospital: Case Studies of Organizational Innovations*. New York: Praeger Publishers, Inc., 1970.

Densen, P. and Bauer, K. *Some Issues in the Incentive Reimbursement Approach to Cost Containment: An Overview*. Health Care Policy Discussion Paper Series Number 7. Boston: Harvard Center for Community Health and Medical Care, May 1973.

Etzioni, A. *Modern Organizations*. Englewood Cliffs, N.J.: Prentice Hall, Inc., 1964.

Etzioni, A. (ed.) *Reading on Modern Organizations*. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1969.

Georgopoulos, B. and Mann, K. *The Community General Hospital*. New York: Macmillan Publishing Co., 1962.

Gustafson, D.H., Doyle, J. and May, J.J. *Employee Incentive System for Hospitals*. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Health Services and Mental Health Administration, Community Health Service. DHEW Publication No. HSM 72-6705, 1972.

Hersey, P. and Blanchard, K.H. *Management of Organizational Behavior*. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972.

Klarman, H. (ed.) *Empirical Studies in Health Economics*. Baltimore: Johns Hopkins Press, 1970.

Lesieur, F. (ed.) *The Scanlon Plan: A Frontier in Labor-Management Cooperation*. Cambridge, Mass.: M.I.T. Press, 1958.

Lincoln, J.F. *Incentive Management*. Cleveland: Lincoln Electric Co., 1971.

Marriot, R. *Incentive Payment Systems: A Review of Research and Opinion*. London: Staples Press, Ltd., 1957.

Maslow, A. (ed.) *Motivation and Personality*. New York: Harper & Row, Publishers, 1964.

McGregor, D. *The Human Side of Enterprise*. New York: McGraw-Hill Book Co., 1960.

Reimbursement Incentives for Hospital and Medical Care: Objectives and Alternatives. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Social Security Administration. Research Report No. 26, 1968.

Schein, E. *Organizational Psychology*. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1970.

Thompson, J.D. *Organizations in Action: Social Science Bases of Administrative Theory*. New York: McGraw Hill Book Co., 1967.

ARTICLES

Austin, C.J. Wage Incentive Systems: A Review. *Hospital Progress* 51:36-41 April 1970.

Bailey, G.V. Hospital Pays Employees Who Improve Their Productivity. *Modern Hospital* 111:109 Sept. 1968.

Bartscht, K.G. This Technic Sets Minimum Staffing Requirements. *Modern Hospital* 111:96-97 Sept. 1968.

Boyer, V. and Smith, A.M., Jr. This Incentive Plan Improves the Care and Lowers the Costs. *Modern Hospital* 111:103-105 Sept. 1968.

Buchan, J.R. Management Engineering: New Approaches Needed. *Hospitals, J.A.H.A.* 44:99-102 May 16, 1970.

Burkhalter, B.R. Can Hospitals Achieve the 20 Per Cent Potential Gain in Employee Productivity? *Modern Hospital* 111:95-99 Sept. 1968.

Drucker, P. Beyond Stick and Carrot — Hysteria Over the Work Ethic. *Psychology Today* 7:87-92 Nov. 1973.

Edgecumbe, R. CASH Approach to Hospital Management Engineering: First Project-Improvement of Nursing Service Management. *Hospitals, J.A.H.A.* 39:70-74 March 16, 1965.

Evans, M.G. Leadership and Motivation: A Core Concept. *Academy of Management Journal* 13:91-102 March 1970.

Flagle, C.D. and Young, V.P. Application of Operations Research and Industrial Engineering to Problems of Health Service Hospitals and Public Health. *Journal of Industrial Engineering* 17:609-613 Nov. 1966.

Freeman, J.R. Systems Engineering: Annual Administrative Review. *Hospitals, J.A.H.A.* 44:151-154 April 1, 1970.

Gross, E. Incentives and the Structure of Organizational Innovation. *Hospital Administration* 16:8-20 Summer 1971.

Hardwick, C.D. and Wolfe, H. Evaluation of an Incentive Reimbursement Experiment. *Medical Care* 10:109-117 March-April 1972.

Hill, L.A. Financial Incentives: How They Could Reshape the Health Care System. *Hospitals, J.A.H.A.* 43:58-62 June 16, 1969.

Howell, W.J. Incentive Plans Can Improve Productivity of Hospital Employees. *Trustee* 20:7-12 Nov. 1967.

Hoyt, C. MEVOP: A Method for Measuring the Economic Value of Production. *Journal of Industrial Engineering* 19:186-193 April 1968.

Innovations in Hospital Management: A Summary of 10 Case Studies. *Hospitals, J.A.H.A.* 43:73-92 June 16, 1969.

Jehring, J.J. Employee Incentive Programs . . . Shared Savings Can Reward Efficiency, Reduce Costs. *Trustee* 21:24-28 Sept. 1968.

Lave, J.R., Lave, L.B. and Silverman, L.P. A Proposal for Incentive Reimbursement for Hospitals. *Medical Care* 11:79-90 March-April 1973.

Lennon, Sister M.I. Department Heads Hold Key to Budgetary Control. *Modern Hospital* 111:108-109 Sept. 1968.

Martin, G.J. Incentives for Economy: Variations of the Connecticut Experiment in Incentive Reimbursement. *Hospitals, J.A.H.A.* 45:52-54 Oct. 1, 1971.

May, D.P. Incentive Reimbursement Experiment: the Connecticut Plan. *Hospitals, J.A.H.A.* 45:49-53 Oct. 1, 1971.

McManis, D.L. and Dick, W.G. Monetary Incentives in Today's Industrial Setting. *Personnel Journal* 52:387-392 May 1973.

Newburn, R.M. Measuring Productivity in Organizations with Unquantifiable End Products. *Personnel Journal* 51:655-657 Sept. 1972.

Pauly, M.V. Efficiency, Incentives, and Reimbursement for Health Care. *Inquiry* 7:114-131 March 1970.

Pozega, G. Hospital's Teamwork Incentive Plan Called "Excellence in Service": Manatee Memorial Hospital, Bradenton, Fla. *Hospital Topics* 49:37-38 Jan. 1971.

Rafferty, J. A Comment on Incentive Reimbursement. *Medical Care* 9:518-520 Nov.-Dec. 1971.

Raske, K. Economic Stabilization Program: Hospitals Near Goal. *Hospitals, J.A.H.A.* 47:45-50 March 16, 1973.

Reddin, W.J. Managing Organizational Change. *Hospital Administration* 15:79-86 Winter 1970.

Rosner, M.M. Economic Determinants of Organizational Innovation: Financial Risk in Trial of New Drugs. *Administrative Science Quarterly* 12:614-625 March 1968.

Schulz, R.I. and Rose, J. Can Hospitals Be Expected to Control Costs? *Inquiry*, 10:3-8 June 1973.

Shuman, L.J., Wolfe, H. and Hardwick, C.P. Predictive Hospital Reimbursement and Evaluation Model. *Inquiry* 9:17-33 June 1972.

Smith, H. Two Lines of Authority: The Hospital's Dilemma. In *Patients, Physicians, and Illness*, E.G. Jaco (ed.). New York: The Free Press, 1958, pp. 468-477.

Soltis, R.J. Systematic Approach to Managing Change. *Management Review* 59:2-11 Sept. 1970.

Wolkstein, I. Incentive Reimbursement Plans Offer a Variety of Approaches to Cost Control. *Hospitals, J.A.H.A.* 43:63-67 June 16, 1969.

DISSERTATIONS (unpublished)

Blessing, W. Administrative Awareness and Acceptance of Hospital Industrial Engineering in Short-Term General Hospitals. University of Iowa, 1969, UMI-MN1050.

Damples, B. A Descriptive Analysis of a Hospital Based Industrial Engineering Program. Duke University, 1970, UMI-MN1-5820.

APPENDIX C

SELECTED CHARACTERISTICS OF EXPERIMENTAL HOSPITALS

Characteristics ¹				Performance Summary ² —Change in Performance Index (C/PI) ^a ; Cost Savings (Savings) ^b ; Net Total Award (Award) for Each Incentive Year ^c .								
				First Incentive Year			Second Incentive Year			Third Incentive Year		
Hos- pital	Number of beds ^a	Type of Ownership ^b	Location	C/PI	Sav- ings	Award	C/PI	Sav- ings	Award	C/PI	Sav- ings	Award
A	52	Proprietary	outside urban area	✓	✓	✓						
B	325	Nonprofit	urban area				✓					
C	524	Nonprofit	urban area	✓	✓	✓	✓	✓	✓			
D	243	Nonprofit	urban area	✓	✓	✓	✓	✓	✓	✓	✓	✓
E	73	Proprietary	urban area	✓	✓	✓						
F	380	Nonprofit	urban area								✓	
G	24	District	outside urban area	✓	✓	✓						
H	270	Nonprofit	outside urban area				✓	✓	✓	✓	✓	✓
I	343	Nonprofit	urban area				✓	✓	✓	✓	✓	✓
J	112	Proprietary	outside urban area									
K	396	County	outside urban area								✓	
L	125	Nonprofit	outside urban area							✓	✓	✓
M	96	Proprietary	urban area	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	128	Proprietary	urban area				✓	✓	✓			
O	53	Proprietary	urban area									
P	625	County	outside urban area				✓					
Q	150	District	outside urban area	✓	✓	✓	✓	✓	✓	✓		
R	349	Nonprofit	outside urban area							✓	✓	✓
S	447	County	outside urban area									
T	76	Nonprofit	outside urban area								✓	
U	189	Nonprofit	urban area									

¹Characteristics information derived from Protocol for Experiment.

a. Number of beds is at the time of sampling.

b. Hospitals M and Y are listed as proprietary but are nonprofit.

²Performance summary information derived from incentive calculations (Plan Administrator Worksheet).

a. A check in the C/PI column denotes a positive change in performance index (C/PI) from the previous year to the incentive year.

b. A check in the savings column denotes a positive cost savings.

c. A check in the award column denotes the earning of an incentive award (that is, a positive net total award).

SELECTED CHARACTERISTICS OF EXPERIMENTAL HOSPITALS

Characteristics ¹				Performance Summary ² —Change in Performance Index (C/PI) ^a ; Cost Savings (Savings) ^b ; Net Total Award (Award) for Each Incentive Year ^c .								
				First Incentive Year			Second Incentive Year			Third Incentive Year		
Hos- pital	Number of beds ^a	Type of Ownership ^b	Location	C/PI	Sav- ings	Award	C/PI	Sav- ings	Award	C/PI	Sav- ings	Award
V	140	Nonprofit	urban area	✓	✓	✓		✓	✓	✓	✓	✓
W	368	Nonprofit	urban area				✓	✓	✓	✓	✓	✓
X	93	Nonprofit	urban area	✓	✓	✓				✓	✓	✓
Y	47	Proprietary	outside urban area									

GLOSSARY

Activity Report. A monthly report, submitted to CASH by each hospital as part of the LPC program. It contained information regarding monthly statistics related to volume and to the actual number of hours worked in individual cost centers and in the hospital as a whole.

Actual Hours. Number of hours worked, as reported by the hospital in monthly and annual activity reports.

Adjusted Inpatient Previous Year Payroll. Net inpatient year payroll for the previous year, adjusted for wage and volume changes.

Annual Performance Index. See Performance Index.

Annual Productivity Questionnaire (APQ). A questionnaire submitted to CASH by each experimental hospital for the base year and for each incentive year. It recorded the hospital's bed size, the total annual incurred payroll dollars and hours (including vacation, holiday, and sick leave), the annual incurred payroll dollars for each of the labor cost centers, the annual volume of activity for each cost center, and any additions or deletions of services involving hospital payroll.

Audit Report. A report that presented and explained differences between figures reported on the APQ and those determined in the audit. It was prepared for each hospital by HSSC auditors at the close of each incentive year. Also called accountant's report.

Base Year. The 12-month period established for each hospital that began between October 1968 and March 1969 and immediately preceded the first incentive year.

CASH Data Monitoring System. Systems and procedures used by CASH in reviewing and validating the input and output data of the LPC program.

CASH Standards and Update Procedures. The system used by CASH to revise and update LPC standards when pertinent operating changes took place in a participating hospital. Pertinent changes included changes in equipment or the addition, deletion, or expansion of tasks, functions, or services.

Close-Out Report. A report that was prepared by CASH and reviewed by HSSC at the end of each incentive year. It included plan administrator's worksheet, incentive year data (annual LPC report, APQ, Audit Report), and previous year data (annual LPC report, APQ, Audit Report).

Commission for Administrative Services in Hospitals (CASH). An independent corporation that is staffed by management engineers and specializes in hospital management and control systems. Its purpose is to assist hospitals develop and apply scientific management and industrial engineering techniques to their operations. CASH created the LPC program and conducted CASH-IRE.

Commission for Administrative Services in Hospitals — Incentive Reimbursement Experiment. (CASH-IRE). Title of the experiment evaluated in this document.

Control Group. A group of 25 hospitals from the Southern California hospital universe selected by the evaluators and statistically matched to the 25 experimental hospitals.

Control Period. The initial 28-day (or one-month) data collection period used in the LPC program. During that

period, each measurable cost center accumulated data on the tasks it performed and the frequency of performance for use in calculating labor performance standards.

Cost Center. An organizational unit of the hospital — usually a department, such as nursing, dietary, laundry, or business office. Also called labor cost center.

Cost Savings (Loss). The difference between the current year's inpatient payroll and the adjusted previous year's inpatient payroll. It provided a measure of the relative decrease (increase) in the cost of hospital labor. Also referred to as gross, unadjusted, or equivalent cost savings.

Evaluation Data System. A data base compiled by the project staff from base-year and first incentive-year annual LPC reports and APQ's for conducting proposed evaluative analyses.

Financial Incentive. Method of providing financial rewards to organizations or people for desired behavior in order to encourage the increase of that desired behavior. Also called incentive payment or award. See Formula.

Formula. The procedure used, in CASH-IRE, for calculating labor costs savings (losses) and the related incentive payments, in which:

$\text{cost savings} = (\text{adjusted inpatient previous year's payroll}) - (\text{inpatient incentive year payroll}) \text{ and}$

$\text{Incentive Payment} = (\text{cost savings}) \times (\text{previous year's performance index}) \times (\text{proportion of patient days covered by participating third-party payers}) - (\text{previous cost losses}).$

Gross Incentive Gain (loss). See Cost Savings.

Hospital Council of Southern California (HCSC). The local Southern California hospital trade association.

Hospital Services of Southern California (HSSC). One of the third-party payers participating in CASH-IRE. Also called Blue Cross of Southern California or Blue Cross.

HSSC Audit. Procedure designed to validate data reported by the hospitals in the APQ for use in determining incentive payments (losses).

Incentive Payment. Net total award minus previous incentive years' losses determined by the formula. (Previous losses refers to previous negative net total award figures.)

Incentive Year. The 12-month period used for comparison with the immediately preceding 12 month-period in determining incentive payments. The experiment consisted of three incentive years following a base year.

Inpatient Payroll. Total payroll minus those amounts that could be attributed to outpatient services or to cost centers that were not comparable between the previous year and the incentive year.

IRE Hospitals. Hospitals participating in the Incentive Reimbursement Experiment.

Labor Performance Control (LPC) Program. A program developed by CASH to measure and monitor the level of labor productivity and changes in that productivity (if any) in hospitals and in individual cost centers. Included the services of management engineers for analyzing data and making recommendations for improving productivity.

LPC Report. A monthly CASH report that provides hospitals with information relating to standard hours (basis and count), standard hours required, actual hours worked, and performance index figures for each cost center and for the hospital as a whole.

Measurable Cost Centers. Hospital cost centers for which labor performance standards have been developed by CASH. A measurable cost center can be a labor center in which the major portion of the workload varies with patient census or with other volume factors or a center for which guideline standards have been developed that relate principally to bed size and span of services.

Medi-Cal. The term used to denote the Medicaid program in the state of California.

Monthly Performance Index. See Performance Index.

Net Cost Savings. See Net Incentive Gain (Loss).

Net Incentive Gain (Loss). Cost savings (loss) less specified deductions. Deductions were made when a department's performance index was higher than 110 per cent or when OB/Ped hours contributed more than 50 per cent to an increase in performance index. Also called net cost savings (loss).

Net Total Award. Net incentive gain (loss) multiplied by the previous year's performance index multiplied by the portion of patient days covered by the participating third-party payers. Also called earned incentive award.

Nonmeasurable Cost Centers. A labor center that does not have measured standards.

Performance Index (PI). A measure of labor productivity based on the ratio of standard hours to actual hours worked (as reported by hospitals). Also called productivity index.

Plan Administrator's Worksheet. The CASH form used in the Incentive Reimbursement Experiment to (1) adjust for departmental productivity greater than 110 per cent, (2) exclude outpatient services, (3) adjust for pediatric/obstetrics services, (4) analyze volume and standard changes, and (5) otherwise adjust figures and compute the incentive payment (loss).

Standard Hours. The number of hours required for a production level equal to a fair day's work (a performance index of 100 per cent) developed through the use of industrial engineering work-measurement techniques.

Standards Data Form. A CASH form used in the LPC program to calculate the departmental labor performance standards.

Statistical Data Record Sheet. A CASH form used during the control period of the LPC program to accumulate the necessary operating information for establishing the LPC program.

Work Performance Standards. See Standard Hours.

DATE DUE

[illegible]

RA 971.3 .H65 1974 Pt. 1

Hospital Research and
Educational Trust.

Incentive reimbursement :

CMS LIBRARY



3 8095 00001530 1